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THE FOOD AND AGRICULTURAL ECONOMIES OF TROPICAL AFRICA: A SUMMARY VIEW

Economic changes now under way and projected in the countries of tropical Africa will inevitably induce stresses to which domestic agriculture must adjust; the way in which the agricultural economy behaves under these stresses can have a profound influence on the rate, even on the presence, of economic growth. If declining rural populations find themselves unable to carry on production at present rates, let alone to increase output to feed the growing cities, a crippling burden may have to be borne by the limited supplies of foreign exchange. To the extent that domestic agriculture can meet increasing total demands for foodstuffs resulting from rising incomes and increasing sophistication of consumers it can contribute directly to raising consumption levels and thereby to economic advance.

Agriculture is the principal occupation of most African producers; foodstuffs account for much the larger part of the income of African consumers. Knowledge of the present nature of African food and agriculture, of the kinds of changes likely to occur in demand for food, and of the probable responses of agriculture, appears critical in appraising tropical Africa's potentialities for economic growth.

In the following pages an attempt is made to set forth some essential characteristics of tropical African food and agricultural economies as they now are, and to suggest their capacity for adjustment to changes that are likely to occur. Quantitative information about African economies is deficient in coverage and in reliability, and detailed qualitative information is not plentiful. The generalized account that follows is based on a variety of sources—ethnographic, economic, nutritional, agronomic, and administrative.[1] It leaves many questions unsolved, and its details are subject to modification, although its generalities probably are not.

COMPOSITION AND QUALITY OF AFRICAN DIETS

African diets are typical of those commonly consumed by people with low incomes almost everywhere in the world. The bulk of each meal consists of a mass of porridge or paste made from one of the starchy staples—cereals, starchy

[1] Many of the more pertinent sources are cited in *14* and *16*.

fruits, or roots—accompanied by a sauce or gravy that adds flavor and contributes fat, protein, minerals, and vitamins. Communities only a few miles apart may rely on quite different staples, although broad zones of cereal dominance or root dominance can be identified.

In the drier grasslands of tropical Africa, including the interior of former French West Africa, Chad, Sudan, Ethiopia, and most of East Africa, the starchy staples are cereals, traditionally millets and sorghums, with some wheat and teff in Ethiopia, and with maize important in some areas. In the moister regions starchy roots usually provide the base for porridge and paste, although rice is the first staple along the Guinea Coast from the Bandama River in the Ivory Coast to Casamance, and banana-plantains are the staple in a few areas, notably southern Uganda, parts of Gabon and the Congo Republic (French), and the eastern part of the Republic of the Congo (Belgian). Maize and rice are also found throughout the moist areas. Of the roots, the most important for the whole region is manioc, although yams, taro, malanga,[2] and sweet potatoes are the first staple in some localities. Manioc is also a major food crop in many parts of the grasslands, notably in the southern part of the Republic of the Congo (Belgian) and western and southeastern Tanganyika; sweet potatoes are a principal staple in parts of eastern Africa. Cattle-keeping people obtain a large part and fishing people living along rivers and the seacoast obtain a substantial part of total calories from animal sources, but these tribes make up only a small fraction of total population. The few quantitative estimates of the composition of African diets that have been made confirm the general impression of heavy reliance on starchy staples as a source of food calories, a characteristic of the diets of low-income populations. Starchy-staple ratios,[3] computed from African diet and expenditure studies, are among the highest in the world.

Proteins in African diets are largely of vegetable origin, coming partly from the starchy staples, but more importantly from legumes—peanuts, beans, and peas—and from green leaves. Approximate diets reported from the region of Thysville in the Republic of the Congo (Belgian), for example, show peanuts supplying 275 calories per day out of a total of about 2,500, and beans supplying 35 calories in one district, 171 in a second, and 684 in a third. Meat and fish, on the other hand, contributed only 6–12 calories per day (*5*). Oil comes principally from the oil palm in regions where it grows, elsewhere from peanuts, shea butter, and sesame.

Variety in the diet is achieved by altering the content of the sauce, by subtle differences in the way in which the starchy staple itself is prepared, and to a smaller extent by changing the staple. Sauces are seasoned with salt and hot peppers and may contain almost anything that is edible, including rodents, insects, leaves, and fungi. Variations in the sequence in which operations are performed lead to a wide range of dishes all prepared from the same foodstuff. Manioc flour, for example, is considered to be a different product when it is soaked in water before grinding than when it is soaked after grinding; if manioc

[2] *Xanthosoma sagittifolium*, the "new coco-yam" of Ghana, where taro is distinguished as the "old coco-yam," *Colocasia esculentum*. Taro originated in southeast Asia, malanga in the West Indies.

[3] The ratio of calories obtained from starchy staples as defined above to the total amount of calories consumed (see *3*).

is crushed before drying, it yields one product; if crushed after drying, another. An African cookbook contains a relatively wide range of dishes made from a restricted number of primary ingredients.

Most often a community relies on only three or four different starchy staples, consumed in turn during the time when they are in plentiful supply. Nicol's studies of diets in three northern Nigerian communities show from 73 to 93 per cent of all calories coming from Guinea corn (sorghum) and bulrush millet, whereas in two southern Nigerian communities from 58 to 75 per cent of all food calories came from yams and manioc (*19, 20*). Some studies, however, show much greater variety: diet studies conducted by Masseyeff and Cambon in Evodoula, French Cameroons, show manioc, malanga, and plantains to be the dominant staples, but taro, yams, sweet potatoes, rice, bananas, maize, and wheat to be seasonally important (*17*).[4]

Diets are those of poor people, but they are not necessarily poor diets. The total supply of calories appears to be adequate everywhere, and Africans rarely know hunger in the sense of persisting shortage of food energy. In many areas there are actual surpluses of manioc, taro, and malanga that go unharvested because their value is less than the cost of harvesting and transporting to market. These unused stocks of roots, principally manioc, constitute a valuable reserve in the event of failure of other staples, but it is a reserve that can be drawn on only at high harvesting and transport cost.

The evidence about total calorie supply is fairly clear, but evidence about malnourishment in the sense of quality of diet is not. Dietary standards appropriate for the African population in a tropical environment have not been worked out with precision, the nutritive composition of many African dishes is not known, and the information from dietary studies is meager and unreliable. Clinical evidence appears not to show widespread nutritional deficiency, but the evidence is confused by the prevalence of many endemic diseases that produce symptoms similar to those resulting from malnutrition. The most clearly determined nutritional disease is kwashiorkor, a disease of children caused by severe shortage of proteins in a diet that normally contains adequate calories. Kwashiorkor is known to affect large numbers of children in some localities, but its general incidence throughout the region has not been measured.

The proteins of peanuts, beans, peas, bambarra nuts (*Voandzeia subterranea*), and of green leaves are of high quality, and when consumed in sufficient quantity there is little reason to expect the low consumption of animal proteins to cause trouble. Nevertheless, there appears to be a general craving for meat and fish on the part of most Africans, although some recent studies suggest that the extent of this desire for animal proteins may have been overestimated.[5]

African diets seem most likely to result in underconsumption of some nutritive elements when special circumstances restrict the variety of foods entering into them. In the villages palatability is insured by the inclusion of a wide range of products of farm and bush in the sauces, and by variations in methods of preparation of the staples. Variety of ingredients also tends to produce good diets. But Africans living in towns find their choice much more limited, and

[4] Peculiarly, this is one study that appears to show insufficient calorie intake.
[5] Some urban budget studies in Ghana show no rise in meat consumption with income (see *12*).

tend to concentrate on a narrower range of foodstuffs. Restriction of choice also occurs occasionally in rapidly growing, isolated communities located in regions with poor soils. In these circumstances some starchy staples provide a much poorer core for the diet than do others. Students of diets containing only a narrow range of foods sometimes speak of "good" and "bad" staple foods, classifying as "good" most of the whole-grain cereals, as "bad" most of the roots. Manioc, in particular, has been attacked as a bad food because of its very low protein content, and indeed it is a bad food if it constitutes the entire diet—as are many other foods. But, ". . . it is an old adage of nutritionists, or at any rate it should be, that there are no bad foods, only bad diets" (*16*, p. 273). One of the serious problems resulting from increasing urbanization is to prevent the advantages of higher incomes from being nullified by a contraction in the variety of foods consumed.

Although total annual calorie supplies appear to be adequate, episodic or even periodic food shortage of brief duration may occur. The so-called "hungry gap" believed to occur in rural communities when food stocks have been exhausted and the staple crop is not yet ready for harvest is a concern of administrators in many territories, particularly when the staple is a cereal. It should not occur when manioc, taro, or malanga are grown, because these roots can be harvested over a period of months, even years. The gravity of the problem in the grain-growing areas may also be exaggerated. It is most unlikely that recurrent shortages occur simply because of improvidence of producers. Ample evidence demonstrates the farmer's concern over protecting his stored harvest from damage in crude granaries or in the rafters of dwellings, and the agricultural systems of many tribes include specific measures, such as mixed cropping and staggered planting, to lessen damage caused by drought, disease, and infestation. More probably, hungry gaps occur episodically when unusual conditions combine to prevent adequate carryovers from the preceding seasons and to cause shortfalls of production in the current one (cf. *18*). On the other hand, consumers may in fact prefer a seasonal fluctuation in total calorie intake to uniform consumption throughout the year. Certainly our own ancestors relished an occasional feast, when they could eat all their stomachs could hold or more, even though it meant going on short rations for a time to pay for it. An African preference for "feast and famine" shows itself clearly in the savings societies in which each member in turn is permitted to spend all monthly savings of the group; it may also influence food consumption.

Diet studies, however, show a different kind of seasonal adjustment to the availability of supplies of particular staples. In Attitogon, Togo, for example, maize is the principal calorie source as long as it remains in plentiful supply. As stores are reduced, however, and prices rise, manioc is increasingly substituted for maize until manioc accounts for 60 per cent of all calories (*21*). Similar patterns are reported from western Nigeria (*10*) and the Cameroons (*17*). The New World crops, maize and manioc, have played an important part in easing the transition from old crop to new crop, maize because it can be harvested green, semimature, or mature, manioc because it can be harvested continuously. Where these crops are grown, even as supplementary foodstuffs, a hungry gap is unlikely.

True famine, as distinguished from episodic shortages of brief duration, is rare, partly because Africans living under traditional conditions are familiar with a great number of wild plants that can be eaten if necessary. Famines have occurred under European occupation in regions of low and variable rainfall, such as Tanganyika and Kenya, or where density is high, as in Ruanda-Urundi. The transportation net in Africa, although very open, is now good enough so that food supplies can be moved into an area of shortage quickly to prevent serious hunger. But fragmentation of the European colonial empires may make this a serious problem for the succession states if supplies must be moved across new national frontiers.

Changes in diets.—African consumers show the usual tendency observed elsewhere in the world to cling to traditional foods and to be reluctant to substitute new staples for the old. Employers find it profitable to inform themselves of the traditional diets of their employees and to insure that the familiar staples are available. It is a mistake, however, to consider these preferences as absolute. The general acceptance of New World crops, now consumed throughout Africa, and in most instances adopted voluntarily, suggests that under appropriate circumstances Africans may be just as willing to adopt new foods as are Europeans. Indeed, they may appear to be more willing to anyone who has seen the stubbornness with which the English in West Africa cling to small, wrinkled potatoes rather than eat easily available and excellent tropical roots, such as yam, taro, and manioc.

Little is known about the conditions under which New World crops were adopted by African communities prior to the European occupation, but enough to indicate that the primary incentives were economic: to reduce costs of growing or to reduce risks of shortages. Cost-price influences are still at work and may cause sudden and dramatic shifts, as was illustrated by a series of expenditure studies conducted in Uganda over the period 1949–57 (*15*).

African food consumption patterns are changing also as the standard of living is altered by rising income and greater familiarity with European standards. In the cities both of these influences are at work along with new cost relationships among traditional foods. Continued increases in income and in urbanization may be expected to lead to the following changes in diet:

1) Total calories ingested per capita are likely to rise only slightly. If benefits of increased productivity and improved marketing are shared generally, the poorest part of the population may be expected to consume more calories than it does now. At the same time, other members of the population may reduce their output of physical energy as mechanization increases and sedentary employment expands, with a consequent decline in calorie requirement. The increase in calories purchased will probably exceed the increase in calories ingested as higher incomes lead to more kitchen waste.

2) The starchy-staple ratio will undoubtedly decline. The inverse relationship between starchy-staple ratio and income that is found elsewhere in the world also appears in African expenditure and budget studies.

3) Among the starchy staples, cereals and meals and flours will become relatively more important, fresh roots and starchy fruits relatively less important. Meals and flours cost less per thousand calories to transport and are easier to

prepare than the fresh products. The thick pastes or porridges—the forms in which bread grains are most commonly eaten now—will probably be displaced increasingly by leavened breads, at first doughy and only partially cooked, but later more and more like the European type.

4) Consumption of fats and oils will rise, especially in areas where the oil palm does not flourish.

5) Consumption of fish and meat, both fresh and preserved, will rise steadily.

6) Demand for exotic foods, particularly canned goods from Europe, will rise sharply.

7) For a time the variety of foods eaten may actually decline because wild products of the countryside are not available in the city. Eventually, however, increases in the number of new foods eaten will more than offset the decline in number of traditional foods.

8) Similarly, consumption of fresh fruits and vegetables may decline for a time because they are expensive to transport. As incomes continue to rise, however, fresh products will be increasingly in demand.

9) In general, consumption of food in value terms will rise with income and with urbanization, creating a demand that can be met in part by increased domestic production, in part by imports.

The effects of some of these changes are already apparent in African cities. Imports of wheat flour and rice, for example, have increased greatly since World War II in most countries of tropical Africa (*13*).

AGRICULTURE

The principal economic resources of Middle Africa, in terms of use, are its land, sunshine, and water, and the principal economic activity of the African population is the utilization of these resources to feed itself and to produce crops for export. African agriculture supplies almost all the food requirements of the African territories, and, except in the Rhodesias and Katanga Province of the Republic of the Congo (Belgian), is the principal earner of foreign exchange.

Technology.—Farming methods in tropical Africa, with certain notable exceptions such as in the Sudanese Gezira, differ little from those pursued centuries ago, and to western eyes appear primitive in the extreme. Fields are small irregular patches in the bush or forest, imperfectly cleared before burning because of the lightness of axes and knives that are the standard implements, cultivated only by hoes and frequently weedy, and containing a mixture of crops planted in what often appears to be completely random disorder. Irrigation and fertilizer use are rare, mechanical or even animal draft power is uncommon, and the area each farm family cultivates is small.

After three or four years in cultivation, the field is usually abandoned to natural growth, and may not be cultivated again for 15 to 20 years. When perennials such as cocoa or coffee are grown the same general practices are engaged in: natural forest trees are left scattered about the clearing so as to provide shade for the economic trees, and food crops are planted among the young trees to provide some return from the land while waiting for cocoa or coffee to come into bearing. Even the experienced observer cannot always distinguish garden plot from bush or abandoned clearing.

It is a mistake, however, to assume that African farming is in fact as crude and inefficient as its casual and unplanned appearance would suggest. African methods are, on the contrary, well adapted to the geographical and cultural environments in which they developed, and changes in them are to be undertaken only after most careful consideration of the ways in which the traditional systems operate. Critics should also be reminded that this "primitive" agriculture supports a rather sizable population, and has done so for many centuries.

Tropical African soils are generally light and relatively low in plant nutrient content even when first brought into cultivation, and unless they are handled with care will rapidly lose fertility through leaching and rapid oxidation of humus content. Heavy rains, even in regions where annual rainfall is low, carry essential minerals down into the subsoil out of the reach of growing plants when they do not wash topsoil itself away. High solar radiation raises soil temperature to the point where the organic content is rapidly consumed. African agricultural methods are designed to deal with these problems in various ways. The most common sort of planting arrangement is to put in three or four crops that will mature at different times but that will maintain a green canopy over the ground until the last is harvested. Mixed and sequential cropping, by maintaining a constant vegetative cover over the soil, reduces the damage of rain and sun. It also provides protection against total crop failure when the mixture is made up of varieties having different moisture and soil requirements and with differing tolerances of drought, wind, and pests. Imperfect clearing of natural cover, and imperfect cultivation of the growing crops, although they may result from the inadequacy of African farm tools, also serve to provide shade and protection to the soil and to assist in re-establishment of bush or forest. The small, isolated fields are more easily recaptured by the natural vegetation than larger ones would be; at the same time spread of plant disease is much slower and more difficult than it is in the vast fields of America and Europe.

Despite all the African farmer can do, however, yields from the light soils will fall below acceptable levels in a relatively short time, and the soil must be allowed to recover its fertility by resting, under natural fallow, for a long period. Protection of the ground surface and the long fallow are the two basic elements of African farming. The African farmer must every year face the necessity of clearing a little more new land to replace that which is allowed to go back into bush, and this is a costly operation. But when uncleared land is plentiful, clearing may be a less costly way of securing fertile fields than would be the addition of organic or mineral fertilizers. Difficulties have arisen only in certain areas where population has increased to the point that land cannot be kept out of cultivation long enough to restore nutrient and humus content to satisfactory levels, but this is not yet a serious problem over most of the area under consideration. As the demand for agricultural products increases, however, because of rising population, rising income, and increasing exports, the problem of maintaining soil fertility at lower cost will become one of the most pressing in African agriculture. When the fallow must be shortened the traditional agriculture can offer no solution. Nor can the problem be solved by indiscriminate introduction of European methods, a lesson now well learned by most agricultural officers in Africa.

Experiences in the Republic of the Congo (Belgian) illustrate what may happen when African environmental restrictions are ignored and farming methods of the temperate zone are applied without modification. In the 1930's Belgian authorities undertook the experimental cultivation of food crops by the most advanced European methods. The forest cover was completely destroyed by cutting, stumping, and burning. The field was then plowed thoroughly so as to remove all roots, and, when brought into fine tilth, planted to a cover crop of legumes. The cover crop was plowed under after one year and the field thoroughly cultivated again, after which it was planted to a rotation of rice, peanuts, manioc, and a leguminous cover crop. The results of this experiment were extremely disappointing. The second crop of rice yielded only one-fifth as much grain as the first had done, the second peanut crop was only one-sixth as large as the first, and even manioc yields were down one-third from the first crop (*16*, pp. 93–95). After other similar experiences the Belgians concluded that a sound agricultural development program in the Congo could only be built on the firm base of traditional African farming, and it was on this base that their ambitious program of *paysannats indigènes* rested (see below, pp. 11–12).

Although the traditional system with its emphasis on continuous field cover and on long natural fallows appears to be the best so far designed, modifications are clearly necessary if agricultural output is to continue to rise. In regions where rainfall is low or highly variable seasonally or from year to year, irrigation, both regular and standby, could greatly increase average yields. But even in the well watered areas, and they are very large, production could be increased as much as five-fold if only the long fallow could be dispensed with. Under pressure of strong demand for land, either because resident rural populations are large or because market prices for farm produce are unusually attractive, some fields are already being kept under almost continuous cultivation, the high prices received being sufficient to compensate for low yields and consequent high cost of production. But the long range solution must lie in better soil management, using fertilizers and rotation of leguminous pasture to hold soil fertility nearer to economically optimum levels. A great deal of research in soil fertility has been undertaken since World War II, and solutions to most of the technical problems of soil maintenance appear to be near. The principal barrier to their application now is an economic one: the high cost of carrying fertilizers from port to farm, and the high cost of carrying crops from farm to market. With improved lower cost transportation we may look for the gradual spread of fertilizer use, and, when suitable leguminous cover crops are proven, to an expansion of green manuring, with, it is to be hoped, pasturing of livestock (assuming that tsetse-fly-borne infections can be controlled).

Agricultural development plans.—The metropolitan governments made numerous attempts, principally after World War II, to improve the productivity of African cultivators. Some failed resoundingly, most were only moderate successes or moderate failures, a few achieved results commensurate with expectations. Two of the ventures that show most promise are the Gezira scheme in the Republic of Sudan, and the paysannats indigènes of the Republic of the Congo (Belgian).[6]

[6] An excellent history of the Gezira scheme is given in *9*. Belgian agricultural development programs, including paysannats, in the Congo and Ruanda-Urundi are reviewed in *2*.

The Gezira development is the outgrowth of fifty years of experiment, planning, promotion, and investment in the triangle lying between the Blue and White Niles. In essence it involved the transformation of some 1,000,000 acres of dry-farmed land to the irrigated production of long-staple cotton by tenants farming on a share basis, after patient experiment had demonstrated that the land was admirably suited to this crop. The government leased land from the original proprietors at a price representing its fair value before irrigation, then sublet to operating tenants for a share of the crop. Capital was provided jointly by government and by a private corporation, the Sudan Plantations Syndicate, which also undertook to manage the entire project for a share of the proceeds. When Sudan achieved its independence the Gezira had approximately 25,000 tenants farming irrigated plots of from 20 to 40 acres. Cotton occupied more than 200,000 acres. The Syndicate's concession expired in 1950 and its functions were then transferred to government.

The history of the Gezira scheme presents an interesting example of the sorts of problems involved in transforming low-yielding land supplying only local needs into land of high productivity supplying a world market, and of lifting an impoverished farming population to relative prosperity. But this development was achieved under conditions not likely to be met with again in Africa for several decades: stable and responsible political authority capable of borrowing at favorable terms and of guaranteeing private investors against unlawful seizure or arbitrary administrative changes. Nor is it altogether certain that the Gezira will be able to continue to operate at its previous efficiency under Sudanese management. Neither the Syndicate nor the British government anticipated that the transfer of sovereignty to Sudan would come as quickly as it did, and as a result failed to train adequately a Sudanese staff prior to independence.

The paysannats indigènes of the Republic of the Congo (Belgian) were a form of cooperative farming, more or less imposed by government, based on traditional farming methods but attempting to overcome some of the inadequacies of that system and to prepare the way for introduction of modern techniques such as mechanical cultivation, use of pesticides, and more efficient planting of improved plant varieties. They, too, relied on cotton in most areas as their principal cash crop. The essential feature of the paysannats was the substitution of rectangular, adjacent holdings, on which all operators followed the same rotations, for the irregular, scattered, individual plots of the traditional system. The lands of a community or tribe were surveyed, with adequate provision for roads, and then reallocated in accordance with the traditional system of rights to land. The orderliness of the new layout, and the complete knowledge of farm holdings that it required, made possible closer supervision of farming practices by agricultural officers. At the very least it was expected to lead to better spacing of plants in the field, and to better compliance with required cultural practices. The large contiguous fields formed by many small plots made possible the use of machines and facilitated the use of dusters and sprayers. Cooperative marketing, storage, and processing associated with paysannats were expected to reduce costs between farm and market.

By 1958 the Belgians had settled 180,000 Congolese families on paysannats in all parts of the Congo, but reliable appraisals of the achievement in increasing productivity have not been made. Perhaps they cannot be, because of the lack

of knowledge of costs and productivity under the traditional system. Some paysannats claimed substantial increases in returns to proprietors, but it is not certain whether these resulted from increased efficiency or from increased effort called forth by more effective supervision. The fate of the paysannats in an independent Congo is uncertain.

Extension services.—Agricultural development schemes such as the Gezira and the Belgian paysannats foster more rapid growth of agricultural production by assigning to government or European corporations responsibility for providing capital and for making general farm management decisions, and by providing a working arrangement between government and farmers whereby farmers can be more easily persuaded, or coerced, into adopting farm practices believed by governmental experts to be beneficial. In their attempts to influence farmers to adopt new cultural methods they represent an extreme form of the much more general system of agricultural extension work that is carried on by government and by religious missions in one form or another in most of tropical Africa.

The avowed purpose of all agricultural extension programs is to acquaint farmers with the advantages to themselves of adopting new methods of farming, including cultural practices, harvesting and handling methods, sales, and record keeping. But extension supervisors and teachers almost inevitably find themselves going beyond the formally prescribed task of informing; especially in countries under paternalistic foreign rule, persuasion, exhortation, and legal sanctions are likely to be invoked in order to compel farmers to adopt methods certified as superior by the departments of agriculture. Reports of the colonial powers on the status of agriculture in their various African territories are replete with accounts of the difficulties encountered in persuading African farmers to do as agricultural officers thought they should.

Administrators were seriously handicapped in many places because they or their predecessors had urged the adoption of methods that did more harm than good, such as deep plowing that led to more rapid soil erosion, or inoculations that killed the cattle they were intended to save. But if the results of agronomic research now under way in many of the African territories are to lead to significant increases in farm output, some sort of agricultural extension service is essential. African farmers are not averse to adoption of new methods once they are persuaded of their efficacy. Extension teachers are apt to face an uphill job, however, until the memory of old failures can be erased by successes confidently to be expected from such proven innovations as improved planting material, insecticides, and fertilizers.

The effectiveness of agricultural extension programs, and of agricultural research, can be greatly increased if extension workers will devote as much effort to learning from African farmers as they do to teaching them. Many past attempts to increase agricultural productivity failed because the officers responsible for them did not study the rationale of African farming systems and did not consult African farmers when new promotions or investigations were being contemplated. Africa has far too few agricultural officers whose understanding of African farmers and farming equals their knowledge of European laboratory

techniques and farming practices. It is just this combination of knowledge, however, that is essential for further agricultural progress.

THE ECONOMIC ORDER

Production of crops for export inevitably involves the African producer in the exchange economy, but production of food crops need not and often does not. Growing food crops for market is an important farm activity in many areas, but a large part of food production never enters the market, and another considerable fraction enters only into local markets where the rule of custom is still strong. In order to understand the organization of the largest part of African production, it is necessary to examine the traditional economy in which most productive activities first came into being and which may still be the strongest determinant of their present form. Only then can the conditions for transmuting the existing economic order into one enjoying the advantages of a modern exchange economy be understood.

The traditional economy.—The economic organization of African communities prior to the European occupation resembled much more the household economies that were the first objects of study of proto-economists than they did the national or political economies now taken to be the subject matter of economics. In some areas, notably the grasslands of West Africa, long-established trading ties with the Mediterranean had introduced elements of the exchange economy that bound together the economically more advanced states of Europe and Asia, but even in West Africa exchange and trade affected only a small part of economic life. Elsewhere their influence was faint indeed.

The essential characteristic of traditional economic life was that the individual's sphere of economic action was limited almost entirely to the small community in which he lived. Production was carried on by thousands of small, unitary economies, each of which endeavored to satisfy its own needs by its own produce. Members of each settlement were bound to each other and set apart from members of all other settlements by kinship, real or simulated, by customary usages, by oral tradition, by law, and often by language as well as by geography. Political ties among these small communities, when they existed, were apt to be weak and unaccompanied by significant economic ties. The attitude toward members of other communities ranged from tentative probationary acceptance to constant hostility. These were island economies, in some ways more isolated from one another by warfare and by manners than by space. They were small, and they were nearly closed.

In such societies as these the crudest forms of distribution serve to link production to consumption. The steps between wants and satisfactions usually can be easily seen, and even when there is some roundaboutness in the production process, all operations are likely to be carried out by the same individuals, or members of the same family. The smallness of the community and the absence of organized exchange prevent development of any but the simplest sorts of specialization associated with sex or age. Economic determinants on behavior are hard to recognize, either by members of the society or by outsiders, because the members are ruled in all their actions by a complex of relationships

among which the economic ones are only one type. When a member of such a society takes part in a harvesting bee, for example, he may be motivated in varying degrees by his enjoyment of participating in a group activity, by his desire to win praise or status, or by his anticipation of the beer drink that will be held when the task is completed. Sometimes an obligation of friendship, kinship, or law toward the "host" may be the determining factor, sometimes it will be the hope that he may meet his current inamorata in the field. More clearly "economic" motives may also be involved, such as his concern to produce enough food to meet the minimum requirements of the village or to insure a surplus for feasting and drinking or for sale, or by his belief that this is a more efficient way to grow the crop, or by the expectation that his efforts will be repaid in kind. He may take part because he wishes to insure the favor or not to incur the hostility of deities or spirits, because his father, uncle, or headman says to, or because "government" says to (sometimes because it says not to). Perhaps members of western society are governed by equally complex motives in their economic endeavors, but in societies in which every activity and every good has a known value in the market it is possible to form some notion of the working of economic forces as distinct from all others; it is much more difficult to do so in the small unitary economies.

Just as fewness of number tends to inhibit specialization with its consequent savings in cost and increase in real income, so also does it tend to restrict economic innovation and change. Good new ideas occur infrequently in any society and are even more rarely translated into action, but they do appear to be a function of the number of persons available to have ideas and to try them out. They are also more likely in a society that already has access to a large store of technical knowledge. When the society is isolated and so small that the total number of possible innovators is small, the chance of successful innovation is proportionately reduced; if the small society is linked to many others by clear and frequently used channels of communication this may not matter, because each new idea can eventually become the property of all, but when each group lives to itself, the small probability of innovation is not offset by the possibility of borrowing innovations from others.

It is characteristic of the traditional society that group controls depend heavily upon blood relationship, marriage relationship, and age. The individual is led by extra-economic sanctions to actions considered desirable by the community, even though the actions themselves may be intended to achieve purely economic ends. Government of the community typically rests with a group of family heads, or of elders, or of a particular age group, or, perhaps less often, with a chief who governs with the consent of his peers. At the same time there is a strong tendency toward economic egalitarianism and toward mergence of the individual with the community. The over-all pattern, economically, resembles that of a family in which all share more or less equally in consumption, although special delicacies may be reserved for the head of the household. It resembles the family, too, in the way in which attitudes of individuals merge with those of the group, and individual and group welfare are identified. Under such an organization it is difficult for an individual to accumulate property in excess of that held by each of his fellows, and accumulation tends to be achieved only

by the leaders who, in effect, hold property for the total community. Nor does the individual feel a strong need to accumulate property as protection against personal disaster, because just as he is expected to share his surpluses with the group, so is the group expected to assist him when he meets with failure.

All this is not to say that economic forces could not make themselves felt or that economic change could not occur in the traditional society. Rather it meant that economic decisions were made by the leaders of the community and then enforced on its members. The decision might be clearly economic but its implementation might not: the heads of the community might decide to adopt a new crop, for example, because it could be grown at low cost, because its yield per acre was high, or because it would provide insurance against food shortage caused by failure of other crops. This in itself is essentially an economic decision. The individual cultivator, however, was often led to plant and cultivate the crop not by these considerations but because it was ordered by his leaders, because the spirits desired it, because it was lucky, or simply in imitation of the chief.

Trade.—The traditional economy has been described so far as if it were completely closed and unitary; in fact there appear always to have been some connections with "outside" and some division of function within. Most African communities required commodities not obtainable within their own territories, and got them through sharing or trading relationships with other communities. Oldest of the traded commodities probably was salt, which could be washed from the ashes of reeds and grasses burnt for this purpose, but could also be obtained in a more satisfactory form by trade with communities having access to salt deposits or to salt-water flats. Iron and copper, too, were objects of long-distance trade at an early date. In some areas special clays that were used as cosmetics or medicines were important trading goods, and intercommunity arrangements may have been made for the exploitation of beds of pottery clay. Disparities in the control of mineral resources led to trade in their products, and in similar fashion groups holding fishing rights in streams, or rights over deposits of sea shells, might trade fish or shells for other products. And some communities also developed special skill in the manufacture and dyeing of textiles, or the making of pots or hewing of canoes, and traded their products for foodstuffs grown by others.

Trading ties between Middle Africa and Eurasia are very old, dating back at least to the time of Christ and probably much earlier. Gold, leather, ivory, ostrich feathers, and slaves travelled across the Sahara from West Africa in exchange for the products of the Mediterranean World, and there was a similar trade between the east coast and Egypt, Arabia, and India.

By the time that Europeans had penetrated the African hinterland, trade and local markets were widespread throughout most of tropical Africa. Today almost all communities participate to some extent in local markets, and a network of long-distance trade routes links the principal regions. But there is a great difference in the degree of participation in the market system. In some of the cocoa-growing areas of West Africa most foodstuffs are purchased and most farmers direct their primary activity to production of crops for market. Some villages, on the other hand, receive only a very small part of their consumption from

outside and obtain almost their total food supply from their own fields. More commonly food and housing are home-supplied, while clothing, some household utensils, farm and household tools, and a very few luxuries are bought with the proceeds of crop sales or wages earned by working outside the traditional society.

One important consequence of the relative isolation of the older communities was that they had few requirements that must be met from outside. Basic wants —food, clothing, and shelter—could be provided by the village except in times of drought, pestilence, or local war. The villager went to market only to obtain those "extras" that he could not himself supply, or to replenish his meager stock of capital goods—such as hoes and knives, that came from the outside. He could only go to market when he had a little "extra" production to sell and buyers to take it.

As communications have improved in Africa, the number of extras available in village and town markets has increased, and the amount of "extra" production for which there was a market has also increased. In most parts of rural Africa this is probably all that has happened; the rural villager still feeds and houses himself by his own efforts, although it has become rare for him to spin and weave his own cloth or to clothe himself in skins.

It is quite otherwise with Africans who work for wages in mining and commercial centers: usually they must buy their food and pay rent on rooms as the older custom of providing rations and living quarters as a part of the wage falls into disuse. When only the man goes to town, however, and wives and children remain at home, the situation may be no more than a perversion of that which prevails in the villages. A man's wages may be little more than enough to pay the cost of his subsistence, unless he receives food packages from home. When he does, the surplus money income permits him to buy "extras" for himself and for his family. The distinction between essential articles of consumption and extras, between necessities and luxuries, takes on a special significance in societies such as these.

To the extent that necessities are produced in the village, survival is not affected by general economic conditions. On the other hand, complete village self-sufficiency sharply increases the danger of famine and food shortages caused by crop failure. If food crops are thought of as something to be grown exclusively for consumption in the villages where they are produced, and the general food policy of the British government in East Africa has tended this way, food crops may not be regarded as normally exchangeable commodities; in some instances when exchange of food against money does take place it may not be based on economic values (*4*). In parts of Africa that are little influenced by the market economy, foodstuffs are sold only occasionally and food prices appear to be uninfluenced by supply or demand and to remain unchanged over periods of years. Prices quoted are purely nominal, and the sale of food to travellers under such circumstances is a form of traditional hospitality to visitors, with the "price" either a part of the gift exchange or a token or receipt. In many such cases, however, price may be in line with a sort of stabilized local value that is economic over a longer period even though it does not fluctuate with short-term changes in supply and demand. Short-term adjustments may take the form of fluctuations in amounts offered for sale.

The money economy.—From the standpoint of the administrator who wishes to increase output, any tendency to regard foodstuffs as primarily subsistence rather than market commodities can pose a serious problem. It may vitiate the effectiveness of price incentives to increase production. At best it causes the supply of crops brought to market, food crops and export crops alike, to be a function only of the demand for "extra" consumption items, rather than of the demand for total income. A policy of village or regional self-sufficiency in foodstuffs inevitably prevents increases in productivity that would result if each community concentrated on the production of those crops that it could grow least well (cf. *11*).

Africans who obtain part of their requirements from the traditional economy, part from the money economy, are most often thought of as being in the process of moving from the old to the new form of economic life. It has been suggested that perhaps they are not moving any place, but instead are permanently fixed half in one system and half in the other.[7] It is possible that when they do change the proportionate contribution of each economy to their income the change may be in the direction of increased reliance on the traditional one. Or they may continue to rely on the older system for food and shelter, and on the newer for less essential consumption, so as to combine the security of the old with some of the higher productivity of the new. From the standpoint of the nation, it is extremely important that the change from the old to new system be carried to the point where at least the major activities are controlled through market-determined prices. It may be helpful therefore to consider briefly the process by which a society can change from a unitary, isolated form to an individualistic one in full communication with the world economy.

Economic growth.—The domestic economy can be made to function as a unit, or as an organism, because it is bound together by ties of blood, by tradition, and by residence. A national economy must rely on less personal ties, and its controls are primarily those of cost and price, which manifest themselves through the market place. Over the centuries these economic controls have proven too to be among the most powerful, to whatever end, that the state has at its command.

Reliance on money will increase as the list of extras that are wanted and that are within the reach of the general population lengthens, that is, as the standard of consumption rises. As some of the extras become necessities, the demand for money will be strengthened further. A notable instance of the transformation of luxury into necessity in tropical Africa is the demand for cloth. European cloth was one of the goods eagerly desired by Africans as early as the sixteenth century, but it is probably only within the past 50 years that cloth of European manufacture has come to be regarded as the usual material for clothing and has largely displaced cloth of home manufacture. European-style textiles are now clearly necessities, not extras.

It is sometimes argued that an increase in the number of goods desired, called here a rise in the standard of consumption, may result in a decline in human happiness. This may be true, but there is in fact little that we or anyone else

[7] See summary of remarks by L. A. Fallers and John Reedman in *7*.

can do about it. Most peoples of the world, whatever their patterns of consumption before they came into contact with the highly productive economies of Europe and America, now desire the material products of those economies almost as ardently as do westerners themselves. Certainly Africans do, and any policy ignoring the strength of this desire is ill-conceived. On the other hand, it is equally important to realize that unhappiness results not from the increase in desires, but from the difficulties encountered in satisfying them. If standard of consumption stands always just a little above level of consumption, it can be a spur to increased effort and efficiency, and the discomfort resulting from the effort may be more than offset by anticipation of ever-rising consumption. But when standard is too much above level, the consequence may be frustration, misery, and social and economic disorganization. Something of the same sort may follow if imperfections in the range of available consumer goods prevent the would-be customer from finding useful and desired articles at prices he is able to pay. This is undoubtedly part of the explanation of the irrational purchases sometimes made by Africans. When a man goes to a shop with money in his pocket and the desire to spend it, but finds only goods he already has, or things that he wants but which are too expensive, or baubles, he is quite apt to spend his money on baubles, be he African, European, or Asian (cf. *6*).

In many parts of tropical Africa the sort of increase in standard of consumption that provokes increased reliance on the market economy is already well under way. It is clearly apparent in the imports of goods of European manufacture, and there is also visual evidence in the villages of increasing consumption of extras, mostly imported, but some of home manufacture. Glass windows, galvanized iron roofs, modern door hardware, lanterns, flashlights, watches, sewing machines, bicycles, and radios are increasingly evident in the more prosperous areas. And even in some rural areas, most notably in western Nigeria, more than half of the food supply, in terms of calories, is obtained by purchase.

The production of crops for sale depends not only upon the producer's demand for purchasing power in the form of money, but also upon the existence of assured regular markets for his products at reasonably remunerative prices. Production by African smallholders has sometimes been inhibited in the past by governmentally administered prices, by licensing of buyers that resulted in restrictive buying practices, and by chartered monopolies. Special privileges for European and Asian concerns may occasionally have served a useful purpose in the early period by introducing modern economic procedures into the traditionally oriented African economies, but they have far too often acted to inhibit the development of just those attitudes and relationships they were intended to foster.

Among the steps that government can take to increase production for market are the familiar ones of improving transport, providing current market information (a much simpler matter now than in the days before the introduction of radio), adopting and enforcing laws requiring performance on contracts, and making available, though not necessarily requiring, government inspection and grading of produce. One of the obstacles to wider use of markets at present is their imperfect interconnection, with the consequence that one market may be glutted while another not too far away may be short. But the capacity of markets

to absorb supplies may be restricted also by the inadequacies of processing industries, and there are undoubtedly numerous points along the market chain where bottlenecks may occur. One of the anomalies of present-day Africa is the widespread existence of surpluses of food and feed calories that go to waste either because marketing and transportation costs are too high or because market and storage capacity are too low.

Increased specialization in production, itself dependent on the organization of economic exchange, will also tend to extend it. In its train, of course, it brings increased risk of bankruptcy and destitution. But the severity of the impact of economic failure can be moderated by society, and competition, of which failure is one consequence, automatically increases the society's productivity by forcing less efficient producers to yield control of resources to those who are able to use them more efficiently.

Modern economies make their greatest contribution to human well-being because, in the words of S. H. Frankel, they free man from the "bonds of space" and from "the bonds of time" (*8*):

> . . . an addition to income implies an expansion of the horizon of individual and social experience. It implies that a subsistence economy, or indeed any microcosmic unit of economic activity, can only escape from territorial, customary, or other limits to its structural growth by integration within a greater whole. . . . To ensure an expansion of future income men must make those changes in their social relations, and form those new personal bonds, which will enable them to make use of, and hence cause them to become dependent on, the income-creating activities of others who can be trusted to make available—in exchange for present benefits—a flow of income in the future. Just as the bursting of customary or physical frontiers releases man from the bonds of space, so too the creation of debt releases him from the bonds of time, and can be regarded as a forcing-house of civilization.

Further expansion of the market economy in tropical Africa will require investment of funds as well as ingenuity, imagination, venturesomeness, and hard work. The possibility of obtaining at least a part of this capital from domestic savings has been more or less overlooked.[8] Studies of the organization of agriculture in a few West African countries, and of the disposition of personal income both in East and West Africa, suggest that the African saver and investor may be able to make a significant contribution. An essential prerequisite of increased African investment, however, as of increased productivity generally, is a further expansion of the outward-looking exchange economy and a withering of the traditional inward-looking unitary economy.

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ROGER W. GRAY

THE RELATIONSHIP AMONG THREE FUTURES MARKETS: AN EXAMPLE OF THE IMPORTANCE OF SPECULATION

Most studies of futures markets have drawn their evidence from a single market, presumably for the reason, among others, that there are not many instances of closely related markets for the same commodity. The three major wheat futures markets in the United States provide an important illustration of a close intermarket relationship, which is given a general formulation here and interpreted to exemplify the importance of speculation on futures markets. Each of these markets, at Chicago, Kansas City, and Minneapolis, is autonomous; yet they are so closely linked by arbitrage that the concept of a tripartite market network is a useful one to apply.[1] In this article an empirical generalization is established which reveals the general relationship among the three markets, and in turn affords new insight into some of the basic principles of futures trading. When the apportionment of the wheat futures business among these three markets is understood, the principle which determines the level of business for any futures market is reinforced and more clearly revealed. The need for better understanding of the principle governing the growth and decline of futures markets is reaffirmed, and interest in it rekindled, by the recent widely divergent trends in business levels among various commodity futures markets, exemplified in the death or languor of those for millfeeds, butter, cotton, and coffee, while those for soybeans, cocoa, eggs, and potatoes were soaring to unprecedented heights.

The evidence presented here may help to elucidate the prospects for futures markets generally, and more particularly those for wheat, which have undergone a less severe decline than a number of other faltering markets. The procedure will be to look first at the general relationship among the three markets; then, in the second part of the paper, to examine some exceptions to the general rule. The exceptions have some intrinsic interest and also help to prove the rule.

THE GENERAL RELATIONSHIP

It is somewhat misleading to speak of our three major wheat futures markets. Chicago is the major futures market, carrying about three-fourths of all the open

[1] Before their business was diminished or eliminated by government pricing arrangements, the wheat futures markets at Liverpool and Winnipeg were parts of an international market network that also included these three.

contracts on all United States wheat futures markets in the postwar period. Kansas City and Minneapolis have divided nearly all of the remainder in a ratio of about two to one in favor of Kansas City. Thus Chicago carries about ten times as much open interest in wheat futures as does Minneapolis—and in some recent years this ratio has been even higher. Yet Chicago is a *cash* wheat market of only secondary importance, Minneapolis and Kansas City ranking first and second, with aggregate wheat receipts eight times larger than those at Chicago. Before concluding that it is surprising that Chicago has so much of the wheat futures business, however, it should be noted that in other terms it is surprising that Chicago does not have it all. There is a marked advantage in, and a tendency toward, concentration in the futures trading of most commodities. In recent years, illustrating this tendency, Chicago has taken the business in soybean meal futures away from Memphis and that in soybean oil futures away from New York. Moreover, the above sketch of the relative shares of the wheat futures business should not be construed as portraying a permanent relationship. Important shifts in these shares have already occurred from one era to another, and the shares sometimes vary markedly, even from one year to the next.

All futures markets depend upon hedging for their existence, but the relative amounts of hedging vary from market to market. It is perhaps more informative to say, in the spirit of a recent article by Working (*1*), that all futures markets are hedging markets, upon which the amount of speculation varies from one to another, largely according to the needs imposed by hedging. Of the three markets considered here, Chicago receives much the greatest proportion of speculation. This is one of two important facts which jointly enable us to formulate the principle of distribution of futures contracts (mainly hedging contracts) among the three. The other important fact is that most hedgers in wheat futures prefer the Kansas City or the Minneapolis market to the Chicago market. The two subsidiary markets (they are not only smaller but, as will be shown here, are the subsidiary markets in a coordinated system of markets) provide a "closer" hedge in two senses of the word. The hedge is "closer" in the geographical sense, in that the elevator and milling firms that do the hedging are concentrated much more heavily in the Kansas City and Minneapolis areas than around Chicago. Wheat stored in Minneapolis or Kansas City is in position for delivery on their futures contracts and out of position for Chicago delivery; wheat delivered on Minneapolis or Kansas City contracts is in position for milling there, as wheat delivered on Chicago contracts is not. The hedge is also "closer" in the sense that the contracts on the smaller markets specify classes of wheat that more nearly represent the needs of most hedgers, whereas that at Chicago permits delivery of any class of wheat, thereby fitting all hedgers at the cost of a looser fit for most.[2]

If these two facts—of more speculation at Chicago and of hedgers' preference for the other two markets—are taken in an extreme form they provide a simple rule of contract distribution between Chicago and the smaller markets. Suppose Chicago to have *all* of the speculation in wheat futures, instead of just most of it; and suppose *all* hedgers, instead of just most of them, to prefer the other two

[2] Prior to 1953 the Kansas City market was effectively a hard wheat market because it was uneconomical to deliver soft wheat there; since 1953 the contract has called for a hard wheat delivery.

markets. Then the open interest would be distributed according to an easy rule: all hedging on one side (long or short) matched by hedging on the other side would go to Kansas City and Minneapolis. All hedging *un*matched by hedging on the other side would go to Chicago to be there matched by speculation. Any additional speculation would also go to Chicago. In this simplified formulation, no mention is made of spreading as such, although it will be introduced later.

In proceeding now to give empirical content to this model we are necessarily guided by the form in which data are available. Quarterly data are chosen because the quarterly figures compiled by the Millers' National Federation provide a unique reflection of the flour mill hedging which is very important in these markets; moreover, although the formulation presented here is limited to the last twenty years, use of quarterly data permits a further check of the analysis for an additional fifteen years, and the check tends to confirm the picture presented here. The open contracts and reported hedging figures are taken as regularly published by the Commodity Exchange Authority, although not all hedging is reported as such, for only large-scale hedging is required to be reported. Finally, we focus here upon the *change* in the open contracts and large-scale hedging over the quarter dating from June 30 to September 30 which encompasses the annual surge in hedging and the accompanying rise in open interest.

The hypothesis to be tested may be illustrated crudely prior to examining Charts 1 and 2, as an aid to their interpretation. It is simply that when certain changes in the level of reported hedging are observed on all three markets, certain changes in the apportionment of the open interest between Chicago and the two satellite markets are to be expected, such that unmatched hedging helps Chicago's business, whereas matched hedging helps business on the other markets. The summer quarter being the period of hedging upsurge that accompanies the harvest movement of the crop, only *increases* need be illustrated. If the hedging increment over a quarter is 10 million bushels on the long side and 50 million on the short, this means an increment of 40 million bushels in unmatched hedging and of 10 million in matched hedging. It leads to an expected increment of 40 million bushels in Chicago's open interest and an increment of 10 million bushels in the combined open interest of the two lesser markets. Reversing the long and short hedging figures would not change the expected apportionment, but a closer balance, for example, would change it. If the aggregate hedging increment of 60 million bushels of the above illustration were divided 30 million long and 30 million short, the expectation would be one of no change in the open interest at Chicago, all of the increase going to the other markets.

There is, of course, a moderate amount of speculation at the smaller markets, more of it long than short; hence they would be expected to receive a little more than the illustration suggests, especially when the hedging is overwhelmingly short, whereas Chicago would be expected to receive correspondingly less. But any further qualifications and refinements can await consideration of the general relationship.

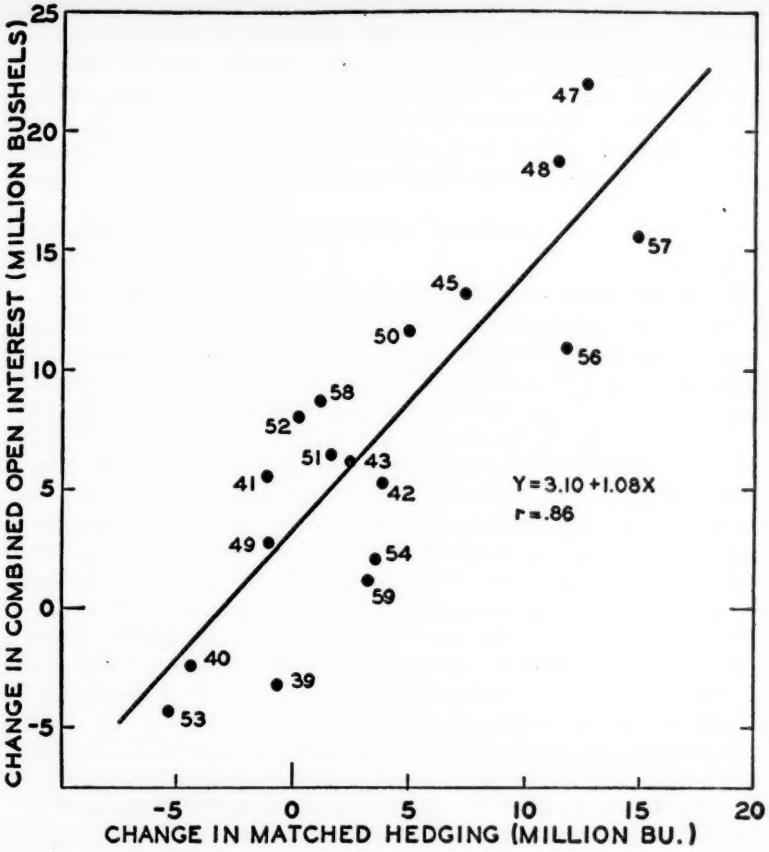
Before considering some exceptional cases that throw further light on this relationship, the process which produces the results shown in the charts may be described more realistically, laying the groundwork for the more detailed ob-

servations that follow. When unmatched hedging begins building up in any appreciable amount at Kansas City or Minneapolis, it will soon be manifest in price disparities relative to Chicago. The typical seasonal occurrence of unmatched hedging corresponds with the movement of the wheat crop into commercial hands; therefore it comes earlier at Kansas City than it does at Minneapolis. Hedgers characteristically use either of these markets with "an eye on Chicago." Hedging is by no means routine on these markets, as it can be at Chicago where its price effect is negligible. If prices on the relevant smaller market have already been put out of line with Chicago, hedgers tend to go directly to Chicago with their business, perhaps hoping to move it back to the smaller market if opportunity arises. The continuous surveillance under which hedgers keep the intermarket price differentials in itself helps to hold these differentials in line with trade ideas of comparative values, but there is also opportunity for profitable arbitrage by professional spreaders, who take opposite positions at Chicago and one of the smaller markets when it appears to them that prices are out of line. The spreading trade that links the smaller market to Chicago may be likened to a device for giving transfusions of speculation to markets whose speculative trade is inadequate to sustain them through periods of strain. It is also true that hedgers are unwilling in general to pay large profits to spreaders for the advantage of the "closer" hedge; hence beyond a certain point all of the unmatched hedging tends to go directly to Chicago. Hedging firms follow various rules of thumb for placing their hedges in the different markets, but all recognize the costs of hedging in the less speculative markets.

For purposes of measuring the relationships depicted in Charts 1 and 2 the two hedging magnitudes were labeled according to changes that occurred during the summer quarters. The reported hedging category (long or short) that changed less during this quarter is called *matched* hedging, even though in a rare summer quarter when one hedging category rises and the other declines neither change is matched by the other. The other magnitude, which we call *unmatched* hedging, is derived by subtracting *matched* hedging from the change in the hedging category that underwent the larger change. Chart 1 shows the relationship between matched hedging on all markets and changes in the open interest at Kansas City and Minneapolis combined. Chart 2 shows the relationship between unmatched hedging on all markets and changes in the open interest at Chicago. Clearly it is matched hedging that determines the level of business on the smaller markets, and unmatched hedging that determines the business level at Chicago.

Two important general principles are manifest in these relationships. The first is that the open interest on futures markets depends upon hedging, this being a principle that is manifest in a unique way in this market complex. More commonly the short hedging of a particular commodity predominates, with the result that total open interest rises and falls in correspondence with the amount of short hedging. This tends to be true also of the aggregate of wheat futures contracts and hedging, but when the aggregate is divided into its components, the dependence of open interest at particular markets upon hedging is seen to be somewhat more complicated, but still very close. The second and less frequently observed principle which deserves great stress is that ***hedging depends upon***

CHART 1.—RELATION BETWEEN CHANGES IN MATCHED HEDGING AND IN COMBINED OPEN INTEREST AT KANSAS CITY AND MINNEAPOLIS, SUMMER QUARTERS, 1939–59



speculation. Despite its preference for the other two locations and contracts, most hedging goes to Chicago for the simple reason that there is a market where the price elasticity of demand for futures contracts is extremely high, which is to say that there is ample speculation to absorb the hedging.

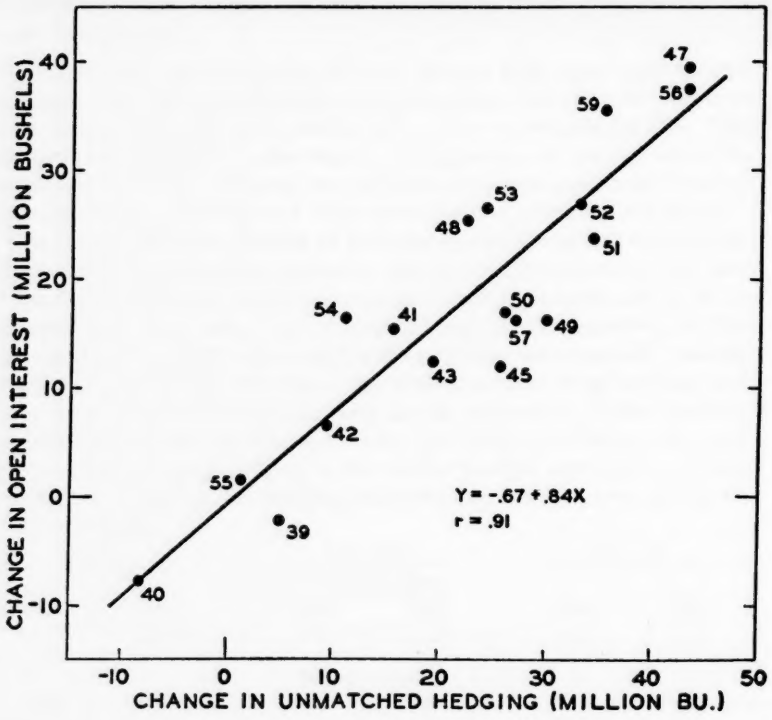
THE EXCEPTIONAL CASES

Three unrepresentative observations were omitted from one or both of the charts. These observations, upon closer inspection, help to support the basic generalization. There follows a discussion of each of these, as well as of an unusual spring quarter situation.

The 1955 Exception: Early Build-Up in Long Hedging

The observation for 1955 was omitted from Chart 1 because the hedging upsurge was predominantly long and was heavily concentrated in the early part

CHART 2.—RELATION BETWEEN CHANGES IN UNMATCHED HEDGING AND IN OPEN INTEREST AT CHICAGO, SUMMER QUARTERS, 1939–59



of the quarter. In that year the two smaller markets registered only one-half of the increase in open interest that would be expected on the basis of the general relationship.

In several respects the summer quarter of 1955 was unusual: the increase in reported long hedging was the largest on record; it was concentrated in the first two weeks of the quarter (in fact, this fortnightly increase was more than half again as large as the entire quarterly rise), and the increase in short hedging, while also heavily concentrated in the first two weeks of the quarter, was considerably below average. All of these idiosyncrasies were of a sort that would weigh against the smaller markets. The early concentration would overtax these markets, both because the earliness would put more of the burden on Kansas City, where the harvest rush of hedging precedes that at Minneapolis, and because such a rapid build-up at any time would overstrain such hedging markets. The fact that the larger upsurge was in long hedging, which is not typical, would also argue against the smaller markets receiving their share, because a larger proportion of the speculation on these markets is long. The usual seasonal rush in marketings tends to create opportunities for long speculation because the short hedging exceeds the long hedging. A reversal of pattern does not meet such a

flexible response on the smaller markets. Finally, the upsurge in long hedging, by the same reasoning, might have been absorbed on the smaller markets in 1955 had not the increase in short hedging fallen below that in long hedging. As it was, the pressure upon the smaller markets, especially Kansas City, was too great, and this exception becomes a further proof of the rule. There was, indeed, marked evidence of preference for the Kansas City market, as the open interest there rose from 12.9 to 31.6 million bushels between June 15 and July 15, but the premium of Kansas City over Chicago, which had been gradually widening, widened by another 2½ to 3 cents per bushel, forcing hedging over to Chicago.

The 1958 Exception: Abnormal Initial Constellation Caused by Speculation

The observation for 1958 was omitted from Chart 2 because the constellation of positions at the beginning of the quarter was highly unusual. In that year, in the summer quarter of maximum surplus short hedging, Chicago registered less than two-thirds of the increase in open interest to be expected according to the rule. This surplus short hedging was of course not absorbed on the smaller markets, but failed to give rise to larger growth of open interest at Chicago by virtue of meeting trading there that represented a reduction in open interest. An increase in short hedging can meet an increase in some category of long positions, thereby giving rise to a larger open interest; or it can meet a decrease in short speculation, thereby occasioning no change in open interest. In general, some of each will occur, although the charts clearly demonstrate that in the summer quarter an increase in short (long) positions is normally met by an increase in long (short) positions, and hence open interest rises. If, however, as in 1958, the constellation of positions at the beginning of the quarter is unusual, having been distorted by unusual changes in the preceding quarter, then much of the increase in surplus hedging may be offset by a decline in speculative positions on the same side, reducing the consequent rise in open interest. The fact is that long hedging was built up unseasonably early in 1958, gaining accommodation from short speculation at Chicago. This unseasonal build-up in long hedging affords an excellent illustration of the opportunities occasionally given to hedgers by the *mistaken* ideas of speculators. A large amount of speculation, following the lead of one well-known trader, was short in May wheat. This so depressed its price as to give hedgers a good opportunity to buy it against forward commitments, which they did. Part of the resulting June 30 constellation of commitments made the following contrast with the usual (data in million bushels):

Date	Non-reporting (small) traders: speculative and hedging combined		Reporting speculative: long or short only	
	Long	Short	Long	Short
June 30, 1958.....	40.8	51.1	3.1	13.1
June 30, other years except 1944....	46.1	30.8	10.0	2.6

Thus, whereas the typical situation is to enter the summer quarter with both of these categories net long, in 1958 both were net short, the departure from normal being 43 million bushels toward the short side, representing that much potential short covering available to meet a surge in short hedging. As was seen

here, much of the short hedging was met in this manner in 1958, in contrast to the usual manner.

The 1944 Exception: Abnormal Initial Constellation Caused by Hedging

A closely similar sequence of events took place in 1944, a year omitted from both charts and worth considering in even greater detail than the other omissions for the simple reason that more detailed information is available for 1944. This happens to fall within the—unfortunately too brief—span of years for which the Commodity Exchange Authority has published the commitments of reporting traders *by markets,* allowing even closer observation of intermarket relations.

The June 30, 1944, constellation of positions was similar to that observed for 1958, these two being the only topsy-turvy ones on record, in the sense that both the speculative and small trader positions had become predominantly short in accommodation of an early surge of long hedging. At the beginning of May there was already a sizable volume of spreading between the two smaller markets and Chicago, the reported position of the smaller markets being net short and Chicago's net long, with hedging accounts already net long on all three markets. This intermarket spreading increased, the net long hedging at Chicago increased sharply, and the net long hedging at the smaller markets increased somewhat, until by June 30 the reported hedging and spreading accounts were as follows, in million bushels:

Chicago		Minneapolis		Kansas City	
		Reported hedging			
Long	Short	Long	Short	Long	Short
22.1	12.7	3.2	.3	5.3	3.1
		Reported spreading			
Long	Short	Long	Short	Long	Short
6.6	2.9	0	2.2	.5	2.0

The corresponding speculative and small trader categories for all markets combined (comparable to the 1958 data presented earlier) showed the following situation, in million bushels:

	Non-reporting (small) traders: speculative and hedging combined		Reporting speculative: long or short only	
Date	Long	Short	Long	Short
June 30, 1958	40.8	51.1	3.1	13.1
June 30, 1944	23.6	35.3	.8	3.6
June 30, all other years	46.1	30.8	10.0	2.6

What had happened to result in the topsy-turvy June 30 position was that flour buying had come early, and mills, partly in response to and partly anticipating flour sales, had built up an all-time high long hedging position in futures. In 1958, as noted above, it was speculators in futures markets who were responsible for the early build-up in long hedging—whereas in 1944 it was speculation by bakers on flour prices that indirectly caused the same early build-up. Since no substantial amount of short hedging comes in advance of the harvest, spreading from the smaller markets to Chicago quickly increased. Soon thereafter all additional long hedging also had to be placed at Chicago, as neither the specu-

lative nor the spreading trade at the smaller markets could absorb more than a minor fraction of this unseasonal hedging burden.

The summer-quarter changes in reported hedging and open interest, which for 1944 provide a very poor fit to the relationships depicted in Charts 1 and 2, may now be shown and explained as a logical outgrowth of the seasonally abnormal situation that preceded them. These quarterly changes were as follows, in million bushels:

Reported hedging		Open interest	
		Kansas City and Minneapolis	
Long Decline	Short Increase	Increase	Chicago Increase
13.0	20.4	6.1	1.6

According to Charts 1 and 2 the changes on the left are supposed to lead to a decline of 11 million bushels in open interest on the smaller markets and a rise of 16 million bushels at Chicago, instead of the observed changes. But this presupposes that the quarter begins with a normal constellation of open positions, instead of the highly unusual one that did occur. As shown in Table 1, the specu-

TABLE 1.—COMMITMENTS OF TRADERS IN WHEAT FUTURES ON THREE MARKETS, 1944
(*Million bushels*)

	Non-reporting (small) traders		Spreading		Speculative		Hedging	
Date	Long	Short	Long	Short	Long	Short	Long	Short
				Chicago				
June 30...	18.3	29.2	6.6	2.9	.8	3.0	22.1	12.7
Sep. 30...	28.7	17.6	3.8	4.0	7.2	2.5	9.7	25.4
				Kansas City				
June 30...	3.2	3.7	.5	2.1	0	.3	5.3	3.1
Sep. 30...	5.7	2.1	.2	.2	.1	1.9	6.5	8.1
				Minneapolis				
June 30...	1.4	1.7	0	2.2	0	.4	3.2	.3
Sep. 30...	5.1	3.2	.4	.2	0	.4	1.7	3.5

lative and small trader positions at Chicago had gone to an unaccustomed net short position in response to the exceptional net long hedging pressure by June 30; then as the hedging pressure was reversed, so also were speculative and small trader positions at Chicago reversed by September 30. The net result was virtually no change in total open interest at Chicago, but an extreme change in its composition. On the smaller markets the normal seasonal rise in short hedging was met by the normal small amount of long hedging. In addition, some buying came from the covering of short positions by spreaders.

The 1940 Spring Quarter

Three instances of response to unusual long hedging needs have been considered. No strikingly unusual short hedging needs arose during the summer-

quarter season to which Charts 1 and 2 apply; but it seems appropriate to single out one such case that arose during a spring quarter, in order to illustrate the amazing "two-way stretch" of this system.[3] At the beginning of April 1940 the Kansas City and Minneapolis markets were already spread heavily to Chicago in reflection of the large (for these markets) net short hedging position which had been built up on them. Their combined net short hedging position (large-scale) of 17.7 million bushels was partially offset in a net long spreading position (to Chicago) of 6.3 million bushels. Chicago's net short hedging position was already three times that at the other two markets combined, yet Chicago was carrying a third of their net hedging and the major surge in short hedging was yet to come. By the end of April the net short hedging position at Chicago had increased by another 31.6 million bushels, while at Kansas City and Minneapolis the increase was only 2.3 million bushels, less than 2 million bushels of which was offset directly on these markets as spreading to Chicago increased still further. The resultant April 30 reported hedging position at Chicago, 86.2 million bushels short and .7 million bushels long, taken with the instances of long hedge absorption cited earlier, illustrates the remarkable capacity of this market to absorb hedging on either side in any season.

CONCLUSIONS

Each of the exceptional cases illustrates in one way or another the flexibility which is the contribution of speculation. The Chicago market, having more speculation, absorbs the surprises, whether they be unseasonal changes, reversals between short and long hedging, or unusually rapid changes. The usual response of speculation to hedging needs, of the sort that dictates the general allocation of business levels among the three wheat markets, while it tends to be taken very much for granted, is a truly remarkable phenomenon. Through what is itself a feat of coordination, the three markets function as one in the coordination of a broad sector of economic activity. But even more impressive than the usual is the response of speculation to unusual hedging needs. The exceptional cases are not really exceptional in principle; they manifest the same underlying principle as does the general relationship.

The two smaller markets undoubtedly owe their survival to Chicago. They have survived the recurrent stresses and strains to which they have been subject because the Chicago market served as a backstop, accommodating the surges of hedging that overtaxed their capabilities. A market that does not serve when hedgers need it most, when unusual and uncertain developments give rise to an unaccustomed and unexpected surge of orders, will likely fall into disuse as a fair-weather friend. Yet, in the sense that Kansas City and Minneapolis are the preferred hedging markets, their capacities are so regularly overtaxed that their dependence upon Chicago may be lost sight of.

The implications of the relationship for the future apportionment of business among these markets is interesting. The level as distinct from the apportionment

[3] For evidence of the usual response of speculation to hedging needs on other markets see *1*.

of their business depends primarily upon the extent to which wheat inventories need to be carried by private entrepreneurs. The government loan program, having reduced this need and thereby the need for hedging, has reduced the level of business on all three markets; if inventory carrying were returned to the private trade it would occasion a great resurgence in the level of business on all three markets. But the apportionment of that business would continue to depend upon the special attributes of the markets. Minneapolis and Kansas City would continue to get the first of the hedging so long as their contract specifications continued to offer advantages to hedgers. Therefore, it is particularly incumbent upon these markets to revise and refine these specifications, as hedging needs change, in order to maintain the advantage. Chicago, on the other hand, must retain as broad a contract as hedgers will continue to use, thereby appealing to the diversity of hedging needs that overflow the other markets and arise also out of soft wheat merchandising. Chicago, moreover, must retain its larger speculative contingent, without which its broader contract specifications would be useless because the hard wheat trade would have virtually no incentive to trade at Chicago and the soft wheat trade would have no more, and at times less, incentive than at present.

For Chicago to try to take business away from Kansas City and Minneapolis on their terms would tend to be self-defeating, because contract refinements that would appeal to one group of hedgers would repel another group. But for the smaller markets to attempt to compete with Chicago on her terms would be utter folly; broadening their contracts would only diminish the advantage they have over Chicago without any diminution in Chicago's advantage over them.[4] The relationships depicted here suggest a delicately balanced network of markets, each offering different advantages to hedgers, who elect to use one or the other according to their current appraisal of relative advantage. Of course, if the two smaller markets could attract more speculation, they could gain at Chicago's expense, this being the contingency that underlies the entire relationship. The predominant position of Chicago in this network is testimony to the importance of speculation; yet all three markets owe their existence to hedging.

Very large changes in either direction in the level of wheat hedging are likely to be accompanied by a reduction in the share of the business going to the smaller markets. A very large decline in wheat hedging would so reduce liquidity as to make the costs of doing business on the smaller markets prohibitive, whereas speculation at Chicago could readily absorb the little hedging remaining to be done. A very large increase in hedging would almost certainly be predominantly short, leading to a larger proportion of unmatched hedging, which according to the general rule tends to go to Chicago.[5]

The general relationship among these three markets may well be unique, but the two major principles which it illustrates are quite general. The first of these

[4] On one occasion there was much mistaken sentiment at Kansas City in favor of broadening the contract. See 2 for an account of the circumstances.

[5] Reference here is to changes from present levels. From the earlier, higher levels, Chicago would have been expected to bear the brunt of the major decline in short hedging, as it did. Chicago's subsequent gains relative to the other markets will be examined in later studies.

is that futures markets arise only out of hedging needs and exist to serve those needs; the second is that those needs are best served where there is much speculation.

CITATIONS

1 Holbrook Working, "Speculation on Hedging Markets," *Food Research Institute Studies*, May 1960.

2 Holbrook Working, "Whose Markets? Evidence on some Aspects of Futures Trading," *The Journal of Marketing*, July 1954.

E. Louise Peffer

STATE INTERVENTION IN THE ARGENTINE MEAT PACKING INDUSTRY, OCTOBER 1, 1946–DECEMBER 31, 1958*

In June 1946 when Juan D. Perón became President of Argentina, the meat packing companies[1] engaged in the export trade were rated among the most efficient and prosperous branches of Argentine industry.[2] Perón's intervention in the export trade in August 1946 reduced them to mere "slaughtering and shipping agents" (*1a*, p. *5*) of the Argentine Trade Promotion Institute (IAPI), the government agency assigned the function of producing the revenues needed to support Perón's domestic program of industrialization and social reforms. Beginning with October 1, 1946, the companies began to experience operating deficits, and continued to do so for the next twelve years—deficits which necessitated government subventions to keep the plants in operation; subventions which became increasingly unpopular politically as they became increasingly burdensome to the government financially. This is the account of the financial vicissitudes of the meat packing industry—and of the Argentine government—in consequence of the meat policy initiated by Perón.

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[1] For convenience, the term "meat packing companies" is used to translate the Spanish term, *empresas frigoríficas*, which in its broad Argentine connotation means more than establishments with cold storage chambers. There are plants in Argentina which do have such facilities, yet do not come within the meaning of the term. Originally it applied only to the large foreign-owned companies engaged chiefly in the export trade. Later, after adoption of a system of minimum guaranteed prices for export steers in 1941 (*2*, p. 152), regional processors specializing in canned meats and meat extracts, who were made subject to payment of the official prices in 1942, were also included in the broad general listing (although their production is segregated in official statistics). Still later, certain companies located in the vicinity of the Federal Capital, Buenos Aires, were required to pay official steer prices, and they now are comprehended in the meaning of the term for statistical purposes.

[2] According to the industrial census of 1946, carried out March 26–27, 1947, the meat packing industry ranked second only to manufacturers of yarns and textiles in the number of employees reported on the day the return was made (*3*, pp. 30–45). It was second to the same branch of the textile industry in total payroll and value of total production for the year 1946, and topped all other industries by 66.5 per cent in the value of domestic primary products used.

STATE INTERVENTION PRIOR TO PERON

Intervention in the Argentine meat trade did not begin with Perón. Effective intervention was first introduced in 1933 with the passage of Law No. 11,747, the National Meat Law, which was basically regulatory in intent. It was adopted to protect cattle producers from possible unfair fixing of cattle prices by the foreign owned companies which at that time had a complete monopoly of Argentine meat exports. Treaty commitments to the United Kingdom during the 1930's further involved the government in matters bearing on the meat export trade with that country and paved the way for the series of meat agreements which governed the meat trade between the two countries from the outbreak of World War II through the first half of 1954. The third stage of intervention was introduced in January 1941, when the Argentine government established minimum prices for export-type steers, which prices only the packing companies engaged in the export trade were obliged to pay.

Despite the broad powers over the cattle and meat trade which these developments reposed in the Argentine government, it had restricted itself largely to safeguarding Argentine cattle interests and refereeing and negotiating the meat trade with the United Kingdom. Yet the system that had evolved in connection with the performance of the several functions described lent itself to Perón's purposes when he decided to interject the government actively into the foreign trade field.

The Meat Law of 1933 created two new entities, the National Meat Board and the Corporation of Argentine Meat Producers, a government sponsored co-operative, both of which were to be financed by a tax on each head of livestock sold in the country.

The tax was deducted by the buyers from the prices paid to producers or commission men, and Meat Board inspectors were posted in cattle markets and packing houses to maintain a record of all sales and all taxes collected. Additional staff and more records were added with the introduction of official steer prices because in each case the applicable price, expressed on a dressed weight basis, was determined in accordance with a system of carcass grading at the slaughter floor. Prewar treaties with Great Britain limited the amount of Argentine meat that would be admitted to that country in any year, and the Meat Board assigned quotas to exporters and cleared all shipments accordingly; this it continued to do when the two governments took over control of the trade. Under the meat agreements, payment was made directly to the Argentine government, which in turn reimbursed the packers. (The meat agreements will be referred to hereafter as "contracts" to distinguish them from the more general trade agreements into which they were incorporated in the postwar period.)

For the term of a given contract the Argentine government received either a stipulated amount of sterling (or credit for it in a blocked account in the Bank of England) for stipulated amounts and kinds of meat, or stipulated unit prices for each kind and form of meat delivered. F.o.b. prices for meat shipped under each contract were fixed by the government on the basis of the expectations under the contract. Since the United Kingdom on its own account, and, from 1942 on, in behalf of the United Nations, was almost the only market for the more expensive meats and by far the largest buyer of all types of Argentine

meat, these prices set an upper limit to what the packers could expect to earn. In the case of steers, which made up the largest part of the beef shipments, the official prices were the lower limit, so that the spread between these two fixed limits had to cover all other costs, overhead, reserves, and profits. (The same was true of Patagonian sheep, but since they do not figure prominently in the subsidy story, they are ignored in this account.) Intent upon passing on to the cattle producers as much as possible of the meat prices established by the British contracts, the Meat Board, when formulating official prices, limited the packers to "reasonable profits" but in exchange relieved them of the risks attendant upon free trade.

INTERVENTION IN THE MEAT TRADE UNDER PERON

Only the last listed item did not appear to fit into Perón's scheme of things. Perón's program was to be financed by siphoning off a part of the profits earned by exports of Argentina's main agricultural and livestock products, but it was not until seven months after IAPI's trade monopoly was instituted that the meat packing industry learned that, in so far as it at least was concerned, the government meant *all* profits.

A new four-year meat contract with the United Kingdom was concluded on September 17, 1946, shortly after IAPI's export monopoly had been instituted. Miguel Miranda, Perón's economic minister and effective head of IAPI, had taken over from the National Meat Board the negotiation of contract terms. The Argentine Central Bank, of which he was also effective head, drew up a new schedule of steer prices—announced in late November without consultation with the Meat Board—which ranged from 22.9 to 36.0 per cent (average, 28.8 per cent) higher than those in the previous schedule (August 22, 1945–September 30, 1946), derived from the 6th British contract. The haste with which the list was published led to misgivings, partly as a result of the fact that, although the new meat contract was to rule from October 1, 1946, the only definite statement on prices in the published terms was that the British would pay at least 45 per cent more than had been paid in the first meat contract (around 7 per cent above 6th contract prices), and that definitive prices, when agreed upon, would remain in force until September 30, 1948. In addition, the British made a single cash contribution of £5 million sterling to IAPI. Therefore, when the government announced the new steer schedule in November, the question was: Would the definitive prices be enough higher, with the addition of the £5 million, to enable the government to make any profit on 7th contract sales? The rate of exchange stipulated in an agreement supplementary to the formal document—13.52 pesos to £1 sterling—made the possibility appear unlikely.

Regardless of the answer to that question, the 6th contract did not promise the kind of profits the government had counted on making from its export monopoly. The supplementary agreement provided that £2 million of the £5 million contribution that the British were to pay over and above the definitive prices would be used in each of the two years to offset higher production costs. It was estimated that this amount would add 4 per cent to contract list prices as ultimately worked out. That would leave at most £1 million of the £5 million contribution, or 13.52 million pesos if converted at the rate of exchange agreed

ports show substantial amounts paid on commercial transactions) and made

on, to take care of IAPI's profits on the British meat trade for a two-year period. In the light of IAPI's expectations,[3] this was a mere pittance. Furthermore, there was no certainty that IAPI could count on all of the 13.52 million pesos as profit. Miranda thereupon set out to obtain better terms, and not until he got an additional cash payment of £2 million[4] were the new steer prices put into effect.

In justifying the additional £2 million contribution before the House of Commons, Dr. Edith Summerskill, Parliamentary Secretary of the British Ministry of Food, said that it was necessary to cover increased costs of production in Argentina (*5*, pp. 879–82). Yet when the Argentine Central Bank ordered the meat packing companies to begin paying the new steer prices in March 1947, with retroactive effect to October 1, 1946, it took no account of the extra £2 million in calculating the amounts the packers were to receive. The exporting companies were authorized to invoice IAPI for shipments of top grade beef at 6th contract prices plus 11½ per cent (*6a*). This was equivalent to the 7½ per cent general increase in the new contract list prices, not agreed upon definitively until May 19, 1947, plus 4 per cent, the estimate made in the supplementary agreement of September 1946.[4a]

THE MEAT PACKERS' OPERATING DEFICITS

The new invoice prices did not cover packers' costs. This was particularly true in the case of steers, which made up the bulk of the industry's livestock purchases. Actually, the new invoice allowances were not as harsh as the differences between them and the much larger increases in official steer prices might lead one to expect; nevertheless they were not cheering. This may be judged from the following tabulation (for purposes of comparison with relevant steer schedules, but in the absence of authenticated invoice schedules, contract prices for refrigerated carcass beef, bone-in basis, are assumed to have been the invoice prices for the 6th contract, and contract prices plus 4 per cent for the 7th; prices are averages[5] for all grades, in pesos per kg, dressed weight (*4d*, p. 19; *7a*):

Contract	F.o.b. invoice prices	Steer prices	Invoice as per cent of steer prices
6th contract	.660	.596	110.7
7th contract	.748	.766	97.7
Increase (per cent)	11.3[a]	28.5	....

[a] The 7th contract price plus 4 per cent; in practice, as the percentage indicates, all contract prices did not turn out to be 7½ per cent higher than those of the 6th, although the entire contract list averages out at 7½ per cent.

If IAPI assumed responsibility for export taxes and duties (its financial re-

[3] An administration spokesman had announced in October 1946 that earnings from export monopoly were expected to reach 2,000 million pesos by the end of 1947; later that year Miranda repeated the same estimate and reported that a profit of 780 million pesos had been made on one transaction in oilseeds (*4a*, pp. 5–6; *4b*, pp. 6, 18).

[4] In exchange for a guarantee to sell 83 per cent of Argentina's exportable meat surplus for the full term of the agreement. During the contract negotiations, the United Kingdom had asked for all of the exportable surplus, but at that time Argentina had refused to concede more than 83 per cent in the first year of the contract and 78 per cent in the second.

[4a] The additional 4 per cent was not allowed for tenderloins, offals, second-class corned beef, and Patagonian mutton, for which the packers received only the prices set forth in the May 1947 list.

[5] These are averages of unit prices for both contracts and both lists. As it turned out, around 85 per cent of the steer meat shipments under the contract were from chiller grades, the three top

ports show substantial amounts paid on commercial transactions) and made liberal allowances for by-products included in its trade monopoly, it may have taken for granted that the companies would break even on the contract trade.[6] That might have been the case had the IAPI steer schedule not been worked out in haste and without regard to changes in the cost structure of the industry since the previous steer schedule was adopted in November 1945. All costs related to the procurement and transformation of cattle into beef ready for shipment had risen since then, and this the National Meat Board would have taken into account when formulating 7th contract steer prices, had not IAPI deprived it of that function.

Even before the new steer schedule was first announced in November 1946, there had been massive wage increases as the result of two general strikes in the meat packing industry during that year (*4e*, p. 11; *4b*, p. 12). In addition, a bonus of one month's wages for every twelve months worked had been introduced. A guarantee of security of employment, which made lack of work the only basis for dismissal of employees, was one of the conditions of settlement of the second strike.[7] The result of these factors was that payrolls increased by 34.7 per cent during 1946 (with the working force only 0.9 per cent higher), while salaries per worker averaged 33.5 per cent above those of 1945. Since the second strike was not ended until November 10, 1946, the companies did not feel the full impact of the two strike settlements until the next year. Salaries per worker in 1947 were 56.1 per cent higher than in 1946, but to understand the full effect of the 1946 wage agreements the comparison must be with 1945; on that basis the increase was 109.2 per cent (*8*, pp. 599, 610).

No longer could earnings on the sale of by-products be counted on to offset processing costs. Nevertheless, the biggest losses were incurred in the purchases of livestock, always the major item in the cost structure of the meat packing companies of Argentina.

Although Perón and Miranda were resolved to stabilize cattle prices, practically everything they did inflated them. Wage increases and Christmas bonuses

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qualities on the official lists, and the invoice price for chilled beef was 99 per cent of the average for these qualities:

Chiller grades, official steer schedule, October 1, 1946–January 31, 1948 (pesos per kg, dressed weight):	
"J" quality	.8366
"U" quality	.7893
"U-2" quality	.7715
Average	.7991
Chilled beef, 7th British contract price plus 4 per cent (pesos per kg, dressed weight):	.7911

[6] There was speculation at the time, encouraged by frequent expressions by Perón and Miranda of animosity toward the foreign-owned firms, as to whether the government's policy toward them did not foreshadow nationalization of the meat packing industry. However much they might have wanted to do so, Miranda had disclaimed any intention that IAPI would "supplant the regular exporter, whose connections abroad are, and always will be, of paramount importance . . ." (*4g*, pp. 6–7). The quoted passage suggests an explanation of why no allowance was made in the new invoice prices for at least a token fee for the services performed by the packers as agents of IAPI. Since the export outlets which each of the companies maintained in Great Britain belonged to the same parent organization (though possessing different corporate entities), it might well have been decided by IAPI that one profit on each carcass of meat was all the chain was entitled to.

[7] This guarantee was to influence costs more than the wording of the clause implies because the unions and the companies disagreed as to what constituted "lack of work," and the union's interpretation usually prevailed.

were not restricted to packing house workers, but were country-wide in application. Meat was subsidized in Buenos Aires proper, the Federal Capital, and in Rosario, Argentina's second largest city. Dissatisfaction on the part of agricultural producers with the prices which IAPI set for their products, combined with higher wages to employees, caused farmers to divert crop land to cattle production, thereby releasing workers who moved to the cities, expanding the urban labor force. All of these stimulated domestic consumption, which rose from 94.5 kgs per capita in 1945 to 101.2 kgs in 1947; consumption of beef rose from 70.3 to 86.6 kgs per capita, while that of mutton and pork declined in the same period because of a drop in production (*7a*).

Cattle prices rose even though sales for slaughter in the country as a whole were 21 per cent higher in 1947 than in 1946, and the aggregate of those in the Liniers Market of Buenos Aires (the most important livestock market in the country), the municipal market of Rosario, and directly to export packers[8] increased by 26 per cent. Liniers, Rosario, and direct sales to packers in 1947 accounted for 73 per cent of total cattle sales for consumption and exportation, with the exception of live cattle exports, normally a relatively small proportion of the total.[9] Prices advanced again in 1948; Liniers Market averages in pesos per kilogram live weight and index numbers were:

	All cattle		Steers	
	Pesos	Index	Pesos	Index
1946.....	.385	100	.410	100
1947.....	.478	124	.497	121
1948.....	.527	137	.527	129

The live weight equivalent of the official price of the top grade of steers in the 7th contract schedule was 527 pesos (*1b*, p. 6), which corresponds with Liniers averages for all cattle and steers in 1948. An equivalent set of figures for direct shipments at official prices to the central packers (which include all but three regional plants whose exports were chiefly of canned meat or extracts) is significant, the more so because weighted averages of prices for direct sales always reflected a greater preponderance of the heavier, higher-priced top grades than the market averages (pesos per kilogram and indexes):

	All cattle		Steers	
	Pesos	Index	Pesos	Index
1946.....	.398	100	.430	100
1947.....	.463	116	.502	117
1948.....	.490	123	.517	120

By long-established custom, the export packers were accustomed to procure around 70 per cent of the cattle needed in their operations directly from the producers, the remainder in the Liniers or Rosario markets, preponderantly in the former. As applied to direct steer sales, the official prices were fixed; it was only in auctions that they were minima.

The 7th meat contract did not run its full course; the 8th was part of the

[8] Direct sales from producer to packer have always been a characteristic of the Argentine cattle trade. Formerly the companies procured the greater part of their livestock in this manner, but more particularly steers.

[9] Unless otherwise indicated, the figures in this section are taken from or based on *7a* and *7b*.

Andes Agreement of February 12, 1948. It made no change in the list prices of the 7th contract, but the United Kingdom contributed £10 million "towards increased Argentine costs of production" of the agricultural and meat products covered (*9*, p. 2). The share assigned to meat was figured at 92,752,000 pesos. Unlike the 7th, the 8th contract specified the amounts to be shipped: 400,000 long tons of refrigerated meat and offals and 20,000 of canned meats to be delivered between February 17, 1948 and March 31, 1949.

According to the National Meat Board, the 92,752,000 pesos would have made possible a 27 per cent increase in official steer prices. This was not forthcoming. No share of that amount was used to reduce the losses at which the meat companies were operating. IAPI continued to pay them 7th contract prices plus 4 per cent.

In the meantime packing house costs continued to soar. Workers' benefits, including pension and welfare funds and health insurance, contributed. Taxes were raised. All materials used in processing went up in price—fuel and packaging in particular. Government encouragement of steer exports to Uruguay and Chile reduced direct sales and helped push up market prices. Even in these circumstances, unit costs were higher than they would otherwise have been because the plants were not operating at full capacity. Domestic outlets for meat were circumscribed. Packers in the neighborhood of Buenos Aires usually sold a part of their output in the city, but IAPI restricted their participation in that trade to a quota, while the concessionaires of the Municipal Packing House were given the lion's share of the trade. The latter were not at that time required to pay official steer prices and were reimbursed fairly promptly for their expenditures; apparently IAPI put no upper limit to what they could pay. The central packing houses not only had to wait for payments, but were required to maintain a larger working force than the volume of business justified. Building up exports to countries other than the United Kingdom to help offset losses on contract and domestic sales was discouraged by IAPI policy. IAPI was as eager as the packers to expand and diversify foreign outlets for Argentine meat, for two reasons that turned out to be incompatible. Expansion of foreign markets for Argentine meat had been a goal since the beginning of the trade, and became the more attractive because the contract system of conducting trade with the United Kingdom had not been as profitable for IAPI as had been expected. It hoped to add to its meat trade profits by gains on sales elsewhere, and therefore made such sales subject to prior approval of prices to be received and to payment by the exporting company of a commission to IAPI on each sale approved; for canned meat the commission amounted to 30 per cent of total receipts, and for beef cuts to 20 per cent. Often the prices stipulated by IAPI were too high to justify attempting sales (*6b*).

When IAPI did not increase steer prices after conclusion of the 8th meat contract in 1948, direct sales began to slip as producers sought out more promising markets elsewhere in the country, obliging the companies to compete with buyers for the domestic market if they were to obtain enough animals to fill their export quotas. This became more costly as the weeks progressed.

While the official prices were minima for market purchases, they were all the government obligated itself to pay. In practice, the government itself never

their attention to formulating a system of recompense for the meat industry that 41

reimbursed the packers at more than the official rates from receipts from British contract sales. When the companies bid above the guaranteed official prices for auction purchases, they were reimbursed for the excess from a Compensation Fund, established in October 1941 shortly after inauguration of the system of official prices. The Compensation Fund was made up of proceeds of a levy of four-tenths of a centavo per kilo of meat produced from steers sold under the official classification and grading system.[10] Because of the demand upon it when more and more packers started sending their steers to auction sales, rather than directly to the packing houses, the Compensation Fund soon proved to be quite inadequate, and the government made no attempt to make up the differences when market prices rose above official levels.

BEGINNING OF THE "SUBSIDIES"

By the beginning of 1948 the foreign-owned packing companies were definitely pinched. Representations made by them directly and in their behalf by the powerful Argentine Rural Society, the Meat Board, and the governments of the United States and the United Kingdom, whose nationals owned and controlled the four largest companies, had brought no alteration in IAPI's system of conducting the meat trade. The day before the 8th contract was signed the companies unanimously refused to commit themselves to make any shipments until prices were known. In this, they had the full support of the Meat Board. As in the negotiation of the 7th contract, neither Meat Board nor packers had been consulted. The Central Bank ignored them although the companies threatened to close their plants (*11*, p. 18); nevertheless they maintained fairly regular shipments for the first half of the year, despite the increasing difficulty in obtaining cattle.

Finally, early in July, the companies notified IAPI that they would make no further attempts to fill the quotas assigned to them in connection with the British contract, but would buy only as many animals as they had cash on hand to pay for. When they suited actions to words, IAPI was induced to increase the invoice schedules (*2*, p. 159).[11] Also, on August 10, 1948, IAPI authorized the companies to present statements of the deficits incurred between October 1, 1946 and May 31, 1948 (later extended to cover the remainder of the year [*10*]) in the processing and marketing of steers subject to payment of guaranteed prices, and agreed to pay 85 per cent of the amounts requested, the remainder to be adjusted after an audit of the companies' books by the Meat Board. The process took longer than was anticipated, and the financial relief promised was not received by the end of the year. IAPI's refusal to consider current adjustments or retroactive payment for deficits incurred with respect to other kinds and types of animals and meat added to the burden. Losses by the companies during 1948 were "extraordinary," and their financial condition was "totally deficit by the end of the year" according to the present Meat Board (*7c*).

In January 1949 the packers again petitioned IAPI for relief, with no immediate response. Miranda resigned on February 2, 1949, and his successors gave

[10] Information supplied by Dr. Antonio R. Vidal Serín of the Argentine Bank of the Nation (*10*).

[11] The President of Swift International is reported as having said, at the annual meeting of January 1950, that partial reimbursement of the financial deficits of his company was begun in January 1948 (*4c*, p. 9).

their attention to formulating a system of recompense for the meat industry that would be sufficiently liberal and flexible to enable them to conduct their affairs in the future without financial deficits. In the meantime they tried to handle increases in packers' costs as they occurred.

On March 15 an advance was authorized to cover a new round of wage increases. On April 19 the exporting companies were notified that they could submit invoices on shipments of all meat to the United Kingdom at levels 62½ per cent above those established by the 7th contract. A new trade and payments agreement pact was being worked out with the United Kingdom, and the meat contract (the 8th, and the 3d in sequence negotiated by IAPI) appears to have been concluded by that time, because the April increase corresponds with the price advances set forth in the formal treaty of July 29, 1949. Allowance of the higher invoice schedules signified, perhaps more than any other development during 1949, the intention of IAPI to put its financial dealings with the companies on a current basis.

On June 2, the Minister of the Economy authorized advances to apply to deficits for the period January 1–April 30, 1949 and until such later date as a satisfactory system of recompense was put into effect. (All of such advances were to be in accordance with the formula adopted in August 1948: 85 per cent of total invoice at time of presentation, with the remaining 15 per cent subject to audit.) However, devaluation of the pound sterling on September 19, and the subsequent revision of the basic Argentine exchange rate from 13.53 pesos per £1 to 9.40 for basic exports (*4h*, p. 17), upset the equilibrium established by the earlier concessions, because the United Kingdom refused to raise 9th contract prices to their post-devaluation equivalent, and IAPI therefore converted receipts from sales to the United Kingdom at the new, less favorable exchange rate.

In January 1950 the economic authorities arrived at a method of handling current obligations for meat shipped, which in their opinion would obviate the necessity for the government to take care of future operating deficits incurred by the companies; the order of the previous June was therefore rescinded. The solution was not satisfactory to the companies. Furthermore, IAPI had not as yet acted on the packers' deficits since 1946 from processing livestock not subject to price limitations but with set invoice schedules for the meat produced and exported. Nor had the packers received the advance, authorized in August 1948, of 85 per cent on deficits incurred since 1946. The latter was received shortly thereafter, however, and in September 1950 retroactive reimbursement for the other types and grades was conceded. At the same time the Meat Board was made responsible for liquidating the past-due accounts.

With the latter date, the government absolved itself of all responsibility for the operating deficits of the companies. Its action was premature. Subsidization of meat consumption in the Federal Capital was withdrawn in July 1949, but the advances in prices aroused so much protest that for political reasons it was reinstated in November, but was based on the higher level of current prices. There were modifications in the system, however. After the July cancellation, the concessionaires of the municipal plant lost their preferential quota for supplying meat for the Capital, and this was not renewed when the subsidy was resumed. At that time the suburbs incorporated into Greater Buenos Aires were

animals in 1949 and 1950. The resulting short supply of mature cattle was not

brought within the subsidy scheme, with authorized distributors at all levels required to observe the price limits set by the Meat Board—the so-called "political prices."

Between 1946 and 1949, IAPI had paid subsidies to the concessionaires of the Municipal Packing Company amounting to 98.8 million pesos (*12a*, p. 63), and in July 1950 an additional 131.1 million pesos was allowed (*7c*). After 1949, IAPI did not report domestic consumption subsidies separately as formerly; they were concealed as subsidies to meat packing companies in general in the annual profit and loss statements.

The government was no more successful in relieving itself of responsibility for other advances in costs of the meat packing industry in consequence of government intervention in the trade. In July 1950 the government broke off negotiations with the United Kingdom on the meat contract for the next year, and at the same time ordered a suspension of all shipments of beef to the United Kingdom. It immediately authorized advances to take account of any financial hardships experienced by the packers in consequence of this action. The suspension was not lifted until the following April. On November 15, 1950 the companies were ordered to increase wages, retroactive to May 1. IAPI attempted to make it possible for them to handle the new wage scales by paying them higher prices for hides and animal fats than were justified by world prices, but this recourse proved to be inadequate, and in July 1951 the government authorized payment of the operating losses resulting from higher payroll costs for the period September 1, 1950 through June 1951. Beginning with July, a revised invoice schedule went into effect, based on a new meat contract concluded on April 23, and the higher wage rates were used in computing the payments which the packers would receive.

As in most prior cases, the decree authorizing payments of the deficit came some time after the deficit was incurred, and authorization did not necessarily mean immediate recompense. In this instance, the norms by which repayment was to be figured were not set out until early in 1952.[12] In contrast, the deficits of the National Packing Company (formerly the Packing House of Buenos Aires) were recognized and paid in full in July 1951 for the period August 11, 1950–June 30, 1951 (*7c*).

Despite the suspension of meat shipments to the United Kingdom between July 21, 1950 and April 23, 1951, prices of meat animals were well sustained by domestic demand and orders from the United States to supply the U.N. forces in Korea. No sooner was trade resumed than export and domestic buyers found themselves competing for a supply of steers which was not equal to the occasion. The main cattle zones of the country had just come through a severe drought, which had caused excessive sales of breeding stock and loss of many young

[12] The procedure was involved: the companies were to be accorded payment for the period January 1–June 30, 1951 of the amounts in excess of the guaranteed price; the difference between the higher prices allowed for hides and animal fats and the expenses involved by the higher wage scales from September 1, 1950, and June 30, 1951; differences between the values of stocks on hand at June 30, 1951, and those established for 1950; repayment of the greater value allowed for sale of meats in the internal market, January–June 1951, as compared with the wholesale prices in Greater Buenos Aires in August 1950; recognition of indirect costs which the companies were unable to absorb on account of the diminished slaughter during the suspension of shipments to the United Kingdom (*7c*).

animals in 1949 and 1950. The resulting short supply of mature cattle was not fully comprehended by the government until resumption of the British trade boosted the demand for steers. By July 1951 the situation in the Liniers Market had become so critical that export quotas were sharply reduced, and in August all exports were temporarily suspended. The government immediately ordered that monthly payments be made to the companies during July–October to cover that part of the fixed costs of processing and merchandising which could not be absorbed by local sales; later decrees carried the payments through January 1952.

While the export ban had been lifted by mid-October 1951, unsatisfactory offerings of slaughter animals, coupled with the fierce local demand, postponed effective recovery of exports. In February 1952, widely publicized meatless days were imposed in order to make more meat available for export; they were not completely abolished until after the fall of the Perón government in September 1955. In order to stimulate cattle sales, the government—once so reluctant to raise official prices—introduced four new steer schedules between July 1, 1951 and October 10, 1952, with seasonal bonuses toward the end of the period to stimulate larger offerings than are normal during the Argentine spring.

With this series of increases, official steer schedules were divorced from British contract prices. The new price schedules could not keep pace with the market, and payment of over-prices became normal procedure. Advances of 85 per cent of the claims thus arising were made fairly promptly for the period July 1, 1951 through May 29, 1952; higher prices of other cattle for the period December 14, 1951–January 28, 1952 were taken care of in the same manner. Another wage increase in May 1952, effective from March 1, led to additional advances to the companies during the year following establishment of the new wage scales. A decree of November 18, 1952 authorized compensation for extra expenses, not included in regular payment schedules, on exports of canned and salted meats between July 1, 1951 and September 16, 1952 (*7c*).

By 1952 IAPI's ventures had ceased to produce the profits needed to support the expansion of industry projected by Perón in 1946. Export prices of cereals and linseed, which had provided IAPI's biggest earnings through 1948, had fallen in consequence of agricultural recovery in the war-devastated countries that had been the most important buyers in the immediate postwar years, while Argentine production had dropped as farmers found there was no profit in producing for IAPI. For these reasons, meat exports were doubly important, which explains the relatively prompt recognition by the government of the extra processing costs.

IAPI was in serious financial straits by 1952, and the failure of cattle offerings at central markets to return to pre-shortage levels aggravated the stringency. The companies received no compensation for extra processing costs between May 16, 1952 and November 1953, aside from the items already listed and a special allocation of funds in May 1953 to enable them to build up a reserve of cold storage meat to tide the Federal Capital over future recurrences of the acute meat shortages which it had been experiencing since 1951. Once more the operating reserves of the companies were low. In November 1953 the government granted them a loan of 250 million pesos until an analysis could be made of their deficits. The total amount later allowed through December 31, 1953 came to 320 million pesos (*7c*). It did not include the "reasonable" profit conceded earlier, in figuring

deficits in the post-Miranda period, the government having decided that 1953 and 1954 must be regarded as "emergency years" (*13*, p. 97). Similarly, in December 1954 a single authorization of up to 300 million pesos was made to apply to net operating losses of the industry for the year, but with no recognition of profits; earlier, 300 million pesos had been allowed to take care of another wage increase, granted in July 1954, retroactive to March 4.

IAPI relinquished direct participation in the meat trade to the Meat Board[13] in December 1954, although the operations conducted by the latter were to be for IAPI's account. Nevertheless, changes introduced almost from the outset of the Meat Board's authority were to be so pronounced that December 31, 1954 has come to signify the end of what is now referred to as "the 99 months" of IAPI intervention.

THE 99 MONTHS

In a study of the antecedents of the packing house subsidies, the present National Meat Board divides the 99 months, October 1, 1946 through December 31, 1954, during which IAPI was the policy-determining agency of the government for livestock and meat trade, into five periods: 1) October 1, 1946–August 1, 1950; 2) September 1, 1950–June 30, 1951; 3) July 1, 1951–May 15, 1952; 4) May 16, 1952–December 31, 1953; and 5) the year 1954 (*7c*). The end of the first period roughly coincided with the suspension of meat exports to the United Kingdom in 1951; the second was a time-marking interlude until the export trade should resume normal proportions; the third begins with recognition of cattle shortages and, together with the fourth, relates to the government's attempts to cope with the situation; during the fifth its efforts began to show positive results.

For the purposes of this study, the 99 months are divided into two almost equal periods: the 50 months ending with August 1, 1950 (the Meat Board's first period), and the remaining 49 months of IAPI controls. The first was a time of abundant cattle marketings, high prices, and, for the period as a whole, profits for IAPI in its meat trade ventures. The second was one of short supplies, higher prices, and, after 1951, losses to the government. There was a distinct difference in its attitude toward the meat packing companies in the second period which appears to have been not entirely related to the unfavorable alteration in IAPI's earning pattern.

As stated earlier (note 6, p. 37), there was speculation at the time IAPI instituted its practice of denying full payment to the companies for meat produced for IAPI's account, that the government was intent on nationalizing the foreign-owned meat firms. Had Perón decided to do so, the act would have been applauded even by many of his adversaries. In a recent article, an American businessman in Argentina states (*14*, p. 22): "The American meat packers in Argentina would probably have been nationalized long ago if past governments had been able to pay for them and knew how to operate them." When the government introduced a bill into the Argentine Congress in 1950 aimed at effecting a major reorganization of government meat agencies and the domestic meat

[13] The National Meat Board was replaced by the Argentine Livestock Institute in 1950, which in turn was succeeded by the National Meat Institute in 1952; in each reorganization the authority of the body was reduced. The National Meat Board was restored, with augmented authority, in May 1957. To avoid confusion, the designation *Meat Board* is used throughout.

packing industry, it was interpreted as a prelude to absorption of the foreign-owned firms by the state (*6c*).

Passage of the bill through Congress was accompanied by iterations of hostility toward the companies. The entire history of their activities was reviewed, with emphasis on past disregard of Argentine interests (*15*, pp. 2950–2965, 3024–3935). This seemed to support the conclusion that the government had designs upon them. Yet a reading of the government's case for the bill leaves the inference that it was more immediately concerned with extending its controls over the domestic establishments, to the end of creating an Argentine industry capable of serving the domestic market more efficiently than those in operation were doing. One gathers this from a statement of the Economics Minister before the Chamber of Deputies (*15*, p. 3029):

> It appears paradoxical, in a country with a capacity for meat production such as ours and a highly developed meat packing industry, that the most efficient plants are dedicated to providing for a foreign market, with almost no contribution to domestic consumption, while the needs of the domestic market are served by inadequate and wasteful establishments. While companies slaughtering for exportation are able to capitalize on the whole animal, in the slaughter yards of the interior and also in those of a number of important cities, by-products are almost completely wasted, because only the meat has any significance . . . One sees the profits that animals at the optimum state of development are able to produce canceled by the high costs resulting from an antiquated and inefficient system of processing.

The Municipal Packing House of Buenos Aires was cited as an example of inefficient exploitation of animal by-products, an inefficiency that had heightened the already heavy costs paid by the government for the meat subsidy.

In a Congress dominated by Peronistas, the bill was assured of easy passage. It repealed the Meat Law of 1933, Law No. 11,747, and enacted instead one which strengthened the government's powers over the internal structure of the cattle and meat trade. The National Meat Board, which had held an almost autarkical position under the old law, was replaced by the Argentine Livestock Institute subordinated to the Ministry of Commerce. The Corporation of Argentine Meat Producers (familiarly known as CAP), the Liniers Market, and the Municipal Packing House of Buenos Aires were made government subsidiaries (*4i*, pp. 13–17.

One aspect of the nationalization was significant. The three institutions had proved less amenable to government pressures than foreign-owned companies, which had everything to lose by defiance. Domestic concerns had defeated official efforts to stabilize cattle prices. Users of the Liniers Market and the Municipal Abattoir had continued to bid up prices; CAP had been the most recalcitrant. It had never achieved much of an industrial establishment, having found that it best served the interests of its producer-stockholders by bidding up auction prices when the market lagged. This it persisted in doing despite IAPI's stabilization drive.

Correcting the shortcomings of the domestic marketing and slaughtering network could not be accomplished overnight. Losses could be cut by trying to

channel as many animals as possible to the central packers in the Buenos Aires area who had the techniques and capacity to handle the largest number of animals. These firms, incidentally, were the only ones whose long-term interests were the same as IAPI's—maintenance of exports at high levels—and which were already subjected to the kind of controls that IAPI had been unable to establish over the Argentine nationals engaged in the meat trade. Because of their capacity they were authorized to provide more meat for Buenos Aires under the subsidy, with results as shown by the following tabulation giving the per cent of total slaughter for consumption (*7b*):

Year	Central Packers	Frigorífico Nacional	Abattoirs of Greater Buenos Aires
1947	31.1	56.1	12.8
1948	32.4	54.6	13.0
1949	29.3	52.8	17.9
1950	30.8	47.7	21.4
1951	37.2	39.8	22.9
1952	62.2	27.6	10.2
1953	65.7	28.2	6.1
1954	70.3	24.4	5.3

After 1950, sales of cattle for slaughter in the Buenos Aires complex of markets and packing houses declined for three successive years, partially as a result of the drought, but also because, as the government tightened its controls of the metropolitan establishments, more favorable prices were paid in the interior markets by black-market butchers. In July 1951, when the Buenos Aires markets first felt the effects of the shortages, the government ordered outlying abattoirs to close, although the first results were much the same as its earlier attempts to enforce its controls elsewhere than with the foreign-owned companies.[14] By the end of 1953, however, the government's efforts had achieved enough success in so far as reducing the incidence of black market activities was concerned that it was able to impose ceiling prices on cattle sales throughout the country with considerable success.

By 1952 it had become critically necessary to export meat, at whatever cost to IAPI, in order to earn foreign exchange. For that reason, the government embarked upon a course of raising official steer prices above competing market levels in order to reinvigorate direct shipments, and at the same time began offering bank credit to producers to stimulate production. In 1954 the inducements to expand production had begun to pay dividends.

Costs of the program during 1953 and 1954 were enormous. Packing house subsidies reported in the two years were 309 million and 468 million pesos, respectively, almost half of the 1,576 million peso subsidy total for the period 1946–54.[14a] Packing house subsidies for the period as reported by IAPI, in million pesos, were: 1949—106, 1950—132, 1951—297, 1952—264; 1953 and 1954, as re-

[14] The first order was directed toward slaughter yards easily accessible from Greater Buenos Aires, but before the end of the year 70 abattoirs in the Province of Buenos Aires had been closed for non-observance of sanitation regulations. Four or five which escaped closure in 1951 were shut down in 1953, leaving only a pair (*16*, p. 35).

[14a] For the period 1946–49, 98.8 million pesos domestic consumption subsidy (*12a*, p. 63); 7.6 million to the packing houses in 1947.

ported above (*12b*). The domestic consumption subsidy is included in the 1949 total because it was not reported separately for subsequent years. In addition to the packing house subventions, IAPI also reported losses of 517 million and 618 million pesos in 1953 and 1954, respectively, on "the commercialization of livestock products" (it is not clear from the report whether these figures include meat) and losses of 1,305 million and 2,951 million pesos, respectively, on agricultural products. Since total profits, in the years in which IAPI reported profits, amounted only to 1,944 million pesos (*12b*), there was no point in going on. In IAPI's 1953 report, it told agricultural and livestock producers that it had been formed to protect them from fluctuations in international commodity prices, and that without its support during 1953 their situation would have been critical (*12c*, pp. 12–14). Although probably true as far as exporters of the cereals and linseed were concerned, the allegation was not true of meat. Meat prices in foreign markets were not spectacular; nevertheless they rose steadily throughout the 99 months. The costs resulting from IAPI's intervention in the meat trade were of domestic origin—the price the country had to pay for subsidizing domestic consumption.

In this connection, it should be added that during the years when IAPI did make profits from its trading ventures, those profits were not used for paying off the operating deficits of the meat industry. As intended, the profits were used to underwrite the various Perón developmental projects. Subsidies were financed from advances by the Bank of the Argentine Nation in the form of rediscounts against national pension and similar funds (*17*, Ch. II). At least where meat subsidies were concerned, little if any of the amounts so advanced were repaid. What is more, the subsidies reported did not cover all of the indebtedness of the government to the companies. Still outstanding was the 15 per cent subject to audit dating back to October 1, 1946. The audits had not been made.

LAST MONTHS UNDER PERON

Cattle receipts in the Liniers Market and by direct shipment to the packing houses had begun to improve during 1954, but not until December was it clear that the crisis of shortage had passed. During the first six months of 1955, Liniers prices fell on an average of 10 per cent below those of the same months of 1954. Because steer prices were supported, they were much better sustained than those of other cattle, declining less than 2 per cent in the same period (*7a*).

To producers accustomed to a sellers' market virtually ever since 1947, a 10 per cent drop was regarded as catastrophic. For many of them it was, because their operations were speculative and heavily financed by borrowing. The clamor for government assistance created an opportunity for the government to achieve the never-relinquished goal of stabilizing prices which the Perón administration had set out to achieve in 1946–47, but which before had been nothing more than a mirage.

On April 28, 1955 the Meat Board announced that henceforth the official grading and price system would apply to all cattle. The scales of grades and prices were published in mid-May; they averaged well above current market quotations (*4j*, p. 22; *4k*, pp. 19, 26). For cattle other than steers, the top prices could "not be exceeded in any circumstances, bonuses, direct or indirect, being

strictly forbidden" (*4k*, p. 19). For steers, seasonal bonuses (May 16–September 30) had been announced on February 7, 1955, and those were the only payments above official scales that the government would recognize (*7a*).

With price stabilization arranged, the government felt that it was in a position to reduce the piecemeal handling of the government's financial accounts with the packers to an orderly procedure. Its plan for doing so was set forth in a decree issued on May 27, 1955 (*7d*): "Considering, that until a solution of the integral problem of the meat packing industry is reached it is convenient to make an adequate adjustment of the financial relations with the companies, to the end of obtaining a greater agility and a better control of the respective operations . . ." The decree applied retroactively to January 1, 1955. The packers were to receive regular reimbursement of the difference between the prices paid for steers according to official grading scales and those received from the sale of meat and by-products. Criteria were established for handling losses incurred in the purchase, slaughter, and processing of animals not subject to official prices. Provisional payment of accounts with the companies was to be made each month, with final settlement made annually on the basis of year-end audits of accounts. A reasonable profit was to be allowed, and was to take into consideration the capital invested; until that time the criterion used in figuring profits was the prices the packers paid for livestock. The new arrangement applied not only to purchases of steers and sale of their meat, but similarly to all cattle and hogs, and to sheep with the exception of those from Patagonia (always handled on another basis).

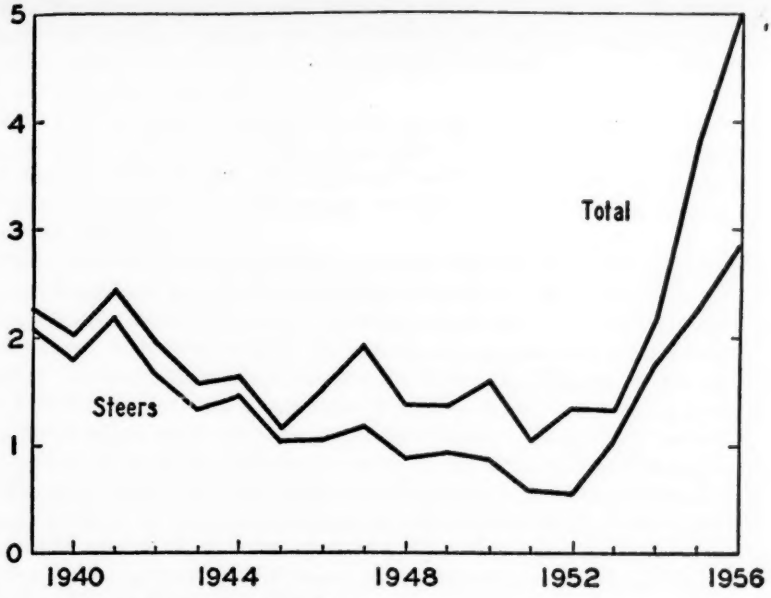
The May 1955 decree was the most comprehensive single piece of legislation issued since controls and the official pricing system had been put into effect, and was honored in the observance to the extent that circumstances permitted. Unfortunately, the new regulations were not equal to the strains the livestock economy was to undergo during the next two years.

The new system of fixed livestock prices was planned to be country-wide in application, but difficulties in working out arrangements caused introduction on the broad scale to be postponed several times (*4l*, pp. 5, 7). In practice it applied only to direct sales to packers because auction markets were not abolished. Later, in July 1955 a new list for cattle, including steers, not covered by the May list, advanced prices by an average of 6 per cent for top quality, heavier animals, with larger increases for animals which yielded less meat per head. The schedule went into effect on September 1 (*4m*, p. 29), a few weeks before the Perón government fell.

The new list was a relief measure. It enhanced the attractiveness of direct sales, already high because of falling market prices. Producers had always preferred by-passing auction markets when cattle were plentiful, as they were in 1955, although prior to World War II the export packers were little interested in beef cattle other than steers. After the Perón-Miranda policies distorted the equilibrium between official and market prices, and later when drought losses and accelerated domestic demand further widened the price differential, forcing the packers to rely more heavily on other types and grades, direct shipments of the latter were better sustained on the whole than those of steers, as is illustrated by the accompanying chart.

By guaranteeing the prices of all animals received on direct shipment, but

DIRECT CATTLE SALES TO PACKERS, 1939–56*
(*Million head*)



* Junta Nacional de Carnes, *Reseña Año 1957*.

not those in auction sales, the government accentuated the former, with a consequent heightening of its financial obligations to the meat packing industry.

THE PROVISIONAL GOVERNMENT AND THE CATTLE SITUATION

The Provisional Government, which took over in September 1955, continued to guarantee the prices of all livestock sold directly to the packers. It also stipulated that prices paid by packing houses for cattle purchased in the Liniers and Rosario markets must not be more than 8 per cent under the official prices for comparable grades. Ceiling prices in auction sales were abolished. Despite continued heavy cattle offerings, guaranteed prices for direct shipments were increased in December 1955 and again in June 1956 (*7a*).

Livestock provided the raw material of one of the largest groups of industries in the country, and meat was always one of the biggest and had been, for the past four years, the surest earner of foreign exchange. Therefore, livestock production had to be sustained at all costs. Also, production of the agricultural export staples had to be revived. In stimulating the latter, and by continuing to support livestock prices at high levels, the government inadvertently encouraged newcomers to cattle growing to sell off their herds and move into crop farming.

Even before the Provisional Government took office, there had been a change in the meat export situation. Argentina had been unable to take advantage of the abandonment of meat rationing in the United Kingdom and the consequent lifting of controlled meat prices on July 3, 1953. Because of cattle shortages, final

meat contract quotas had not been filled by that date. Not until June 1954 was Argentina in a position to take advantage of the favorable wholesale prices that had prevailed for the preceding eleven months in the Smithfield Market of London, whose auctions strongly influenced wholesale and retail prices throughout the United Kingdom. Even by mid-1954, the supply of cattle in Argentina had not revived sufficiently to permit heavy exports, so that it was not until 1955 that the impact of heavier cattle slaughter in Argentina made itself felt. Refrigerated beef arrivals in the United Kingdom were 75 per cent higher in 1955 than in 1954, but of almost as great importance as the volume involved was the change in the form in which the beef was delivered. Under controls the British had imported it in the frozen form so that it might be stored until required. With the lifting of rationing and the end of contract shipments, most of Argentina's beef began to go forward in chilled form, as the following tabulation of British imports shows (in 1,000 pounds; *7e*):

Year	Refrigerated total	Chilled beef
1954	90	11
1955	158	99
1956	248	227
1957	257	233

This brought it once more into competition with the best Scottish and English beef, as the closest equivalent of the fresh beef which the British have always favored.

Smithfield Market prices were well sustained through the second quarter of 1955. With the third quarter a decline set in that continued through 1956, as is illustrated by the following averages, in pence per pound (*7e*):

Source	2d quarter 1955	3d quarter 1955	1st quarter 1956	4th quarter 1956
Scottish, fresh	31	27¾	25½	22¼
English, fresh	29½	25½	23½	18¼
Argentine, chilled	25½	20½	18½	16

Responsibility for the drop in prices was not entirely the consequence of the larger quantities received from Argentina. During the immediate postwar years the British government had been encouraging livestock production in order to reduce its reliance upon imported meats, with the result that supplies of fresh beef for domestic consumption had increased from 605,000 long tons in 1938 to 704,000, 806,000, and 815,000 long tons in 1955, 1956, and 1957, respectively (*7g*). British beef accounted for 51 per cent of the total supply for consumption in 1938 (1,190,000 long tons) and for 65 per cent in 1957 (1,256,000 long tons). The good prices for top grade Scottish and English beef from July 1953 through June 1955 reflected a sellers' market. Augmented domestic supplies and the revival of imports of Argentine chilled beef combined to make it a buyers' market. Protests by British cattle producers that the Argentine was "dumping" beef in the United Kingdom, and by doing so was forcing British prices down, led to demands that the British government reimpose import quotas. Argentine critics of Meat Board policies charged that it permitted the companies deliberately

to sell Argentina's finest product at lower prices than were bid for English and Scottish beef, which they maintained was in no way superior to Argentine chilled grades. The Meat Board thereupon decided to impose limitations on shipments of beef to the United Kingdom to brake the decline in market prices there, hard pressed though it was to dispose of the surplus of quality beef at home even when chilled beef exports were high.

Cattle sales for slaughter during 1956 were so large as to be almost unmanageable; the year's total was 1.7 million head higher than in 1955. Of a registered cattle slaughter of 11.2 million head, around 7 million qualified for the guaranteed prices; in addition, 1.5 million hogs were paid for in accordance with the official scale (*7a*; *7b*).

While protecting domestic producers through support prices and absorbing losses resulting from low prices received on meat exports and from processing surplus high-cost chiller-type steers in forms for which the selling price was not commensurate with those paid for the animals, the government continued to subsidize domestic consumption. As was the case with IAPI reports for the years 1950–55, later statistics do not make it possible to ascertain precisely how much the domestic meat subsidy cost the government. Of the 2,724 million pesos paid to the packing companies to cover deficits for the period November 1955–December 1956, 1,690 million pesos were designated as having been paid to apply to meat for domestic consumption and reimbursement of export retentions (*18*, pp. 15–16). (Of the remainder, 550 million pesos were labeled as subsidies for the packers and 476 million pesos covered wage increases which went into effect on February 1, 1956.)

The retention was a feature of the revised exchange control scheme put into effect in October 1955. According to commodity, 10–30 per cent was withheld from proceeds of exports and deposited in the National Economic Recovery Fund, established on October 27, 1955, for the purpose of fostering agricultural recuperation and paying subsidies until such time as they could be eliminated (*19*).[15]

Since the meat packing industry was paying support prices for cattle that were higher than the market prices that could be obtained for the meat produced, the retentions paid on meat exports added to their operating deficits, deficits which the government was committed to reimburse from the very fund into which the retentions were paid. How much the retentions were and what the real cost of the domestic consumption subsidy was during the period were concealed by combining them in one total.

The amount allocated for meat and packing house subsidies by the National Recovery Fund in 1957 was 641.2 million pesos (*18*). The much smaller figure does not mean that the crisis of overproduction had passed, but that the Provisional Government, appalled by the cost of subsidizing livestock prices through 1956,[16] had decided that the time had come to divest itself of the burden of subsidy payments.

[15] In the case of meat the retention was 15 per cent. Subsequently it was adjusted several times, according to type and the form in which the meat was exported, and then was abolished as of May 30, 1957 (*20*).

[16] Hog prices had been freed on March 28, 1956 (*21*, p. 5).

MOVE TO ELIMINATE SUBSIDIES

On February 15, 1957, the Government decreed that subsidies on meat and cattle were to end. It would continue supporting steer prices for 60 days to the maximum of 30 centavos per kilo, but would not be responsible for deficits incurred in the purchase of any other type of meat animal slaughtered after February 20. Maximum wholesale and retail prices of meat in the Federal Capital and Greater Buenos Aires were also abolished (*7d*). Ceiling prices of mutton and lamb were abolished on March 28 (*4p*, p. 29), and with them the system of compensation to the packing companies for hogs and sheep purchased at prices guaranteed by the government. During the 60 days in which the government would continue to subsidize steer prices, the Meat Board was to find a method of maintaining steer standards and prices without subventions.

By removing ceiling prices of meat at the retail level in Greater Buenos Aires, the Provisional Government was able to relieve itself of one of the causes of higher packing house deficits during 1955/56. The prices of meat under the subsidy had been maintained without change since 1953 (*21*, p. 14). The closing down of slaughter yards in the Province of Buenos Aires in 1951 and 1953 had augmented slaughter in the packing houses and a few other establishments which had been added to the list of those to which the government guaranteed reimbursement of operating deficits. As soon as the Provisional Government took over there began to be a clamor for reopening slaughter yards, and on March 14 and November 8, 1946 the National Meat Board adopted resolutions with that end in view for the Buenos Aires area. However, high cattle prices and low ceiling prices of meat at the retail level defeated expectations (*21*, p. 6). It was impossible to operate in such circumstances without subsidy. Therefore the companies that fell within the system that guaranteed reimbursement of authenticated deficits continued to receive cattle in numbers far beyond their optimum capacity, while the slaughter yards were not restored on the scale intended. The February 1957 decree removed the handicaps standing in the way of renewal of their operations (*4n*, pp. 13, 20).

It took longer than 60 days for the Meat Board to produce a plan for steers that was acceptable to the government. The new regulation was not decreed until May 24 (*7f*), and differed only in detail from the one adopted in 1941 when the system of official prices was put into effect.

One of the details was that the government emphatically refused to accept any obligation to compensate future losses incurred by the packers as a result of the mandatory minimum prices. Despite this pro forma disclaimer, the law provided that the packers would be paid "compensation prices" which would take into consideration the amounts paid for steers purchased at official rates, and the prevailing range of prices of meat and by-products; in addition, if circumstances required, the expenses of production, marketing, and processing might also be taken into consideration. No change was made in the official steer schedule decreed on June 6, 1956, except that it once more was made to apply to steers purchased in Liniers and Rosario cattle auctions.

To offset possible losses to the packers resulting from market purchases at higher than official rates, the Compensation Fund was reconstituted by crediting to it the balance remaining in the former fund, and by advancing 200 million

pesos to it, to be repaid from a tax of 3 per cent on the proceeds of all beef exports. The tax was thenceforth expected to be the mainstay of the fund. Also earmarked for it were proceeds in excess of the return the packer was authorized to receive according to the cost-plus processing allowance based on the price of the steer (*7f*). (To simplify the abstruse: the Meat Board paid the packers fixed amounts for beef produced from steers paid for at officially prescribed prices, regardless of the price for which the beef was sold. If the price received for the meat was lower than the fixed price, the difference was to be made up to the packers from the Compensation Fund; if it were higher, the excess went into the fund.)

The May 1957 decree appeared to make provision for such operating deficits as might occur in the future. There still remained outstanding the unpaid balances of the "subject to audit" indebtedness that had been accumulating since October 1, 1946.

"SUBJECT TO AUDIT" BALANCES

As soon as the Provisional Government assumed power, the foreign-owned companies, individually and through their joint representative, kept their situation constantly before the authorities. Not satisfied with the progress being made, on May 2, 1956 they addressed a communication to Dr. Juan Llamazares, the Minister of Commerce, calling attention to "certain functional aspects of the Industry, which merit immediate attention by the authorities, to the end that this vital industry . . . should not run the risk of succumbing [as would be the case] if the process of frank decline should continue."[17] The note listed the immediate causes of the financial difficulties, then reviewed the background of the deficits: "during the past decade—and in virtue of different laws and decrees—there were transferred to the Frigoríficos large sums of money in compensation for or refunds of financial deficits, designated by those who appear not to know the technicalities of trade, as subsidies to the packing houses." Reminding the minister that those deficits had resulted from determinations on which the industry was not consulted and that the "badly labeled" subsidies had not been sufficient to pay off the debt accumulated over years as a result of the incomplete settlement of accounts, the companies warned him that if the government did not quickly modify its financial dealings with them, they would soon be in the position of the railroads; "already their [the companies'] financial penury is such that they are not able to maintain their equipment, much less their plants . . . ."

The government had more urgent problems. As 1956 progressed, current packing house deficits mounted, and these deficits were not comprehended in the payments authorized by the National Economic Recovery Fund, which were restricted to those arising from subsidization of domestic consumption. So many cattle were being offered for sale that even the enormous Argentine appetite for beef was sated. Although the administration put exports to the United Kingdom on a quota system, it tried to promote sales to foreign coun-

[17] Translated from the text of the original memorandum signed by Swift de Rosario, Swift de la Plata, Wilson and Company, Armour de la Plata and La Blanca (both Armour owned)—U.S. firms —and Frigorífico Anglo, Leibig's, and Bovril and Company, British.

tries which did not normally import Argentine meat and to spur additional exports of meat and cattle to countries that did. This led to protests of charges of dumping from some countries and curtailment of orders. Because markets and packing houses lacked the capacity and the railroads adequate rolling stock to handle all of the cattle offered, producers had to hold animals on pasture beyond their prime. The government thereupon authorized slaughter of overweight steers for canning. These were paid for at official rates, since the overweight resulted from circumstances beyond the control of the producers, further contributing to the mounting deficits of the companies.

The companies did not receive payment for the steers for canning until the meat was sold. Export outlets for canned meat were limited, leading to large accumulations of stocks, which meant that working capital and storage space needed for other operations were tied up.

For example, CAP had close to 17 million pesos tied up in such "superstocks" (*22*, pp. 7, 18–19). CAP also lost heavily on exports of livestock to Chile, Bolivia, and Uruguay, which it had expanded in furtherance of the Meat Board's drive to find foreign outlets for the cattle exports; livestock did not come within the compensation scheme arranged for meat exports. (CAP had also taken similar losses during 1954–55, when it was government-controlled; it was returned to the stockholders in December 1955.) There was another deficit item, arising from undervaluation by the Meat Board of shipments to the United Kingdom during the first months of 1956. All of these awaited adjustment along with the unpaid balances which had been accumulating since 1946 because the government had not made the audits upon which settlements were to be based.

Finally, on August 5, 1957, the Economic and Social Council formalized procedures for handling unpaid accounts for the "99 months" because of "the necessity of restoring faith and confidence abroad in the . . . word of the Argentine Government, lost during the deposed regime." The Meat Board was authorized to determine the net losses of the individual companies which had been "assisted by the State during the period . . . October 1, 1946 and December 31, 1954 . . . from the date which they were incorporated into the system of aid . . ." (*7g*).[18] The balances due were to be worked out in accordance with norms set forth in the covering decree, and the National Recovery Fund was to provide the means of payment.

[18] The analysis was to be subject to a number of conditions. It was to be made on a year-by-year basis, and was to cover purchase, slaughter, and processing of cattle, sheep, and hogs. Included in the costs recognized was the full price paid for all animals purchased. A variety of packing house activities and costs was excluded. A "reasonable" profit based on the price paid for the cattle was to be allowed for the full period. In the case of cattle slaughtered for exportation, the profit allowed was 5.75 per cent; for domestic consumption 1.5767 per cent. However, individual companies that showed profits in excess of the percentages allowed, and could demonstrate that those profits were the result of industrial or commercial efficiency in the operations comprehended by the audit, would be permitted to retain the higher amounts. The analysis was to be made and the balances paid to the individual companies 120 days after each had presented its accounts for the period under review. In undertaking to settle the accounts for the "99 months," the government made it understood that it accepted no responsibility for the later deficits; its action was not to be regarded as a precedent, nor could it be invoked in claiming losses for other periods. (One item reveals an interesting sidelight on IAPI's financial dealings with the companies. When the government authorized payments on its accounts with the companies, the payments were labeled as "anticipos"—advances. They were advances only in the sense that they were payments on accounts whose full amount had not been determined. But, because they were called advances, IAPI treated them as loans and charged interest on them. The August 1957 decree ordered that the Meat Board should not include such interest charges in figuring processing costs.)

The Provisional Government was putting its affairs in order preparatory to turning them over to the administration to be elected February 28, 1958. In the meantime, however, the arrangements worked out in May 1957 for financing official prices of steers were not proceeding according to plan, and the Compensation Fund was obliged to make up the differences between official and market prices in all cases where the buyers represented companies obliged to pay the guaranteed prices. (This will be discussed in the Statistical Appendix.) By the time the Provisional Government bowed itself out of office on May 1, 1958, the Compensation Fund had been exhausted, and the Government was 194.6 million pesos in arrears to the packers for deficits covering the period May 27, 1957 to April 30, 1958 (*10*).

THE RECORD OF THE PROVISIONAL GOVERNMENT

During the first eighteen months of the Provisional Government, it had continued the livestock and meat policies of the Perón administration virtually without change. Ceiling prices were maintained for cattle and sheep at levels which were higher than free market prices would have been with cattle offerings as abundant as they were. Yet meat for consumption in Greater Buenos Aires continued to be sold at the same retail levels imposed in 1953. The political and economic situation was too precarious for even a military junta to risk intensifying unrest by raising them.

As had been the case since the system of official steer prices was adopted in 1941, the meat packing companies were the agents of the government—the paymasters, the "bankers" in carrying out the intermediate financial aspects of its policies. These functions they continued to perform, but with smaller financial involvement, because the unprecedented cost of underwriting price supports for livestock while at the same time subsidizing meat for domestic consumption led the administration early in 1957 to eliminate much of the expensive superstructure of state intervention in the meat industry introduced under Perón. In addition, a beginning had been made toward clearing up the backlog of debt to the packing companies.

THE FRONDIZI ADMINISTRATION AND THE PACKERS

With the government of President Arturo Frondizi the old troubles began to reappear. On the eve of his inauguration on May 1, 1958, it was announced that wages would be raised 60 per cent above those of February 1, 1956, the last government-imposed general increase; one of the first acts of the new Congress was to give statutory effect to the fiat. However, the government did not adjust the commercial values of the beef produced from steers purchased in accordance with the May 24, 1957 decree, which provided for such adjustments. The decree specifically stated that the "fixing of minimum prices for steers in accordance with the provision of the present Decree, may not give place to the paying of subsidies by the State" (*7g*), and the Compensation Fund, from which packers' losses were to be met, was exhausted. Although the Frondizi administration assumed responsibility for the arrears on deficits experienced in the period May 27, 1957–April 13, 1958 that remained unpaid on the latter date, it, the administration, revealed no intention of doing so for those arising from its own

acts. It could not afford, and in any event it was not disposed, to assume losses imposed on a largely foreign-owned industry in consequence of a law that was country-wide in application. On the other hand it was not prepared to relinquish or weaken the controls that made such losses inevitable.

This was not the only resemblance to the policies of IAPI in its Miranda-phase. To the direct impact of the wage increase was added the indirect effect on cattle prices resulting from a spurt in the demand for meat. Official steer prices had not been raised since May 1956, and even in April 1958 Liniers auction prices were only slightly lower than the direct sale average, live weight. In May and June the Liniers averages were higher in consequence of the active demand. A corollary to disparities between official and auction prices was a drop in direct shipments of steers to packers, which in May were lower than April receipts by 70,000 head, a decline of almost 40 per cent, and in June were around 40 per cent of the April total. In order to revive direct sales, and hence reduce auction competition, the government issued a new list of steer prices on July 2, averaging 30 per cent higher than the 1956 list, to apply to all packers' purchases made since June 23 (*23,* p. ii).

Before publishing the new official steer prices, the administration had informed the packers that the "commercial values" of steers would no longer apply in the case of those purchased by them to supply the domestic market. The commercial values established by the May 1957 decree comprehended the adjustments packers were authorized to receive from the Compensation Fund for the difference between the cost of the steer plus processing and other expenses and the prices at which the meat produced was sold, when costs were higher than receipts. Henceforth, government would not be responsible for losses incurred in consequence of increased wages or higher steer prices, when steers were destined to be slaughtered to supply the domestic market. The revision was made "in order to avoid the payment of a form of subsidy by the State" (*4s,* p. 20). Commercial values continued to be recognized in purchases for exportation but in every case, as formerly, the Meat Board decided what the commercial value would be: proportionately how much for purchase and sales costs, labor, transportation, overhead, profits, etc. These were adjusted to take the new steer prices into account but made no allowance for the wage increase. The industry estimated that the new wage and steer rates would add two billion pesos annually to production costs (*24b,* p. 8; *25a,* pp. 8–9), the equivalent of $47 million, U.S., at the free market rate of exchange then current (around 42.5 pesos/$1).

So lively was the demand for steers that auction prices kept pace with the new official rates, rising from 3.38 pesos per kilo live weight in June to 3.98 pesos in July, a larger absolute gain than had been registered in any year since 1934, at least. The new rates therefore failed to accomplish the purpose for which they had been adopted; the end result was higher meat prices.

As early as May, the over-all increase in the price of foods had aroused consumer complaints (without reducing consumer demand). The reaction of the government was the same as that of Perón when he came to office: a campaign to reduce profiteering. In order to protect producer and consumer interests, middleman profits were to be held down, and committees were appointed to investigate each industry almost on a company-by-company, shop-by-shop basis.

Holding down middlemen's profits in industries and commercial establish-

ments not subject to the rigid controls exercised over the meat packing companies was not easy to accomplish. Various methods were attempted and unfavorable publicity was resorted to when other pressures proved unproductive. In the case of the wholesalers and retailers of meat, the government tried to persuade them not to price the meat they sold at more than enough to produce receipts that would average 25 per cent above the price paid for the meat purchased by them. They held out for 30 per cent. Neither side was willing to concede.

Negotiations, if that is what the stalemate could be called, dragged on. In the meantime, cattle prices continued to rise. The advance in steer prices indicated earlier, which averaged close to 18 per cent for the month of July, was surpassed by the average for all cattle sales, which was close to 22 per cent. The average conceals the progressive nature of the price rise, which in the course of the month amounted to 50 per cent (*4r*, p. 15; see the Statistical Appendix for the details of cattle and meat prices).

Because of the falling off in direct shipments of steers, the packers were obliged to buy a larger part of their cattle requirements at auction, as is shown by the following comparisons of the number of head purchased by packers and abattoirs subject to official price control during July with the April 1958 record, the most recent month in which the totals were not influenced by the Frondizi wage and cattle price advances (*23*, pp. 87, 89, 145):

	Cattle	Steers
April 1958		
Slaughter	584,000	246,800
Direct purchases	225,000	184,800
Market purchases	359,000	62,000
July 1958		
Slaughter	540,800	210,300
Direct purchases	137,900	109,200
Market purchases	402,900	101,100

Of a reduction of 43,200 head in total cattle slaughter, steers accounted for 36,500 head. In an effort to reduce costs, the packers shifted a larger share of their purchases to animals not subject to minimum price regulations or, in the case of steers, from the top to lower, cheaper grades (77 per cent of the reduced steer purchases were in the so-called chiller grades). The consequence of the changed buying pattern was that of a total drop in beef production of 8,900 tons, steer meat accounted for 8,000 tons.

The companies had to maintain their working force and, to the extent possible, tried to supply their traditional markets. The price of Argentine chilled beef in the Smithfield Market of London, which had been relatively stable from the beginning of 1956 through the first quarter of 1958, had begun to advance and by the third quarter of the year was 26 per cent higher than the first quarter average (*23*, p. 219). Sales of cured meat to the United States, though comparatively small, were nevertheless profitable. And high meat prices in the Buenos Aires area, though not high enough to cover the advance in operating costs, helped cut the margin of loss. Nevertheless, operating deficits were mounting; in addition to bank debts, the companies were far in arrears in payments to

cattle producers. In mid-July they notified the National Meat Board that unless relief were forthcoming they would have to suspend operations (*24b*, p. 8).

Despite its depleted treasury and its reluctance in principle to concede responsibility for the packers' deficits, the government authorized the National Meat Board to pay the industry up to 200 million pesos "to assure the normal functioning of their establishments with a view of enabling them to meet their commitments in respect of salary increases, and avert the possibility of delays in paying for their cattle purchases" (*4q*, p. 35[19]). The government could not afford the drop in meat exports that would occur if the packing houses carried out their threat. It was in no position to take over the companies itself, and could not immediately replace the managerial personnel who would leave if the companies closed. (The experience with the railways purchased from the British had left a scar. Almost at once there occurred a deterioration in efficiency that has never been restored.) What was more, they would have a large body of unemployed workers to provide for if the plants closed. The six American companies alone (the five of Armour and Swift, which had been combined in April 1958 as International Packers Ltd., and Wilson and Company) employed around 45,000–50,000 workers (*24a*, p. 8). These are only two of the reasons the government was unwilling to permit the companies to halt operations. The country desperately needed the foreign exchange from meat exports. In addition export taxes collected on them, which in the case of refrigerated meat amounted to 13.5 per cent ad valorem, contributed important revenues. Probably the decisive consideration was that the government was courting foreign capital investments and had no wish to create the bad publicity which would arise if long-established foreign-owned companies were to withdraw from the country because government regulations made it impossible to stay in business.

The 200 million peso credit of mid-July was a temporizing measure, as the government was well aware. It was, however, reluctant to adopt the solution recommended by the Provisional Government before it relinquished office and advanced by the packers in their recent protest: revision of the exchange rates to allow the companies to earn more from their foreign sales. The President of the Meat Board supported the position of the companies. Among other arguments, he maintained that if the government allowed exporters of wheat, which required virtually no processing, 23 pesos per dollar in exchanging their foreign currencies, there was no justification for an exchange rate of 18 pesos per dollar for meat, which required a much larger degree of processing (*24c*, p. 7). Higher authorities appeared to be bemused. On the matter of government controls over foreign enterprises they were as ultranationalistic as Perón had been initially; witness the reversal of the processes which the Provisional Government had introduced. They appear to have been opposed to altering the exchange rate

[19] The payments were authorized by Decree No. 2,269, July 11, 1958, and were all made within the next two months, as follows (in million pesos; *14*):

August 6	96.1	August 29	3.7
August 7	16.3	September 2	11.8
August 11	25.8	September 15	3.0
August 20	3.6	September 29	9.4
August 25	19.3	Total	189.0

structure for meat export receipts to allow the packers a larger share of the earnings, but at the same time had tacitly conceded, by authorizing the 200 million peso advance against deficits already incurred, that the companies could not absorb the costs of the wage and steer price increases from current earnings. While struggling with this dilemma, the administration set a precedent for future deficits of a larger order than those already caused by its policies.

A demand for maximum meat prices, which began to be heard as soon as prices began to rise in May, had become a ground swell. Most province governments had begun reimposing them in May, and furnished the example which the federal government was urged to emulate (*23,* pp. iii–v; *25b,* p. 13). By July the clamor had become part and parcel of widespread disenchantment with Frondizi on the part of the working class whose votes had put him into office. Frondizi, who had campaigned on an intensely nationalistic platform and had written a book condemning the iniquities of the big international oil companies, was now granting exploration contracts to foreign oil companies and using every means in his power to attract foreign capital. Expressions of discontent with this and the spurt in living costs were going beyond grumbles, and there was real anxiety that the administration might not survive. Then, on July 23, the government announced that maximum meat prices would be restored on August 1 on retail meat prices in Buenos Aires and its suburbs (*21a,* pp. 1, 8).

Actually, the government did not intend to restore the former system of subsidies. The new maximum prices were described as "mobile": the retail price to "depend on the price paid by the butcher for the carcass, a margin of 25 per cent being allowed in each case." As stated, the purpose was "to protect the consumer while at the same time seeking to avoid any adverse influence on the prices received by the producer" (*4t,* p. 37). It was the method chosen by the government to resolve the impasse with the meat retailers, but the announcement contained the magic words "maximum prices" to soothe the populace.[20] And it was price control; however mild, it was regarded as a possible first step to renewed intervention on a larger scale.

Faced with increasing government intervention and other evidences of Peronitis in the body politic, the foreign-owned companies immediately notified the Meat Board that they had stopped buying cattle and that, unless a satisfactory solution of financial and other arrangements between the government and the industry were reached within a week, they would close their plants on August 1 and leave the country (*24c,* p. 1; *26a,* p. 8). The National Meat Board sprang into action by trying to persuade the companies, on the one hand, to reconsider, and other branches of the government, on the other, to move off dead center

[20] As one who was in Buenos Aires at the time, I cannot help wondering whether the determining influence in the decision to restore the controlled prices was the scheduling of a memorial service for July 26 in a public park in Buenos Aires to mark the sixth anniversary of the death of Eva Perón. There was apprehension throughout the city as to what repercussions the widely publicized event might produce, since the followers of Perón who had supported Frondizi's candidacy were rated the most dissatisfied with his foreign economic policy as president. Early in the week in which the service was scheduled to take place, pacifists and communists made a token attack—rocks, bottles of ink, and the like—on the building in which the U.S. Embassy is housed, in protest against the landing of U.S. troops in Lebanon. This provided Frondizi with an excuse to ban for the time being all gatherings in public parks or grounds. Announcement of the restoration of the ceiling prices on meat coincided closely with the imposition of the ban, and could well have been intended to offset some of the rancor it created.

and do something positive. Not until it achieved some success in the latter direction did the companies modify their decision.

On July 26 the Secretary of Agriculture announced that the exchange rates on meat exports had been revised; the details were contained in a Central Bank circular issued July 28. In the future, 65 per cent of the foreign exchange earned on exports of beef, mutton, and lamb would be made at the official rate of 18 pesos per $1, U.S., or its equivalent in other currencies, and the remainder at free market rates. Foreign earnings on offals, specialties, and other livestock products and by-products would be exchanged on a 50/50 basis (*4t*, pp. 15, 57; *23*, p. vi).

On this basis the companies agreed to continue operations, at least for the time being, although it was doubtful whether the situation would be greatly improved in their favor if a rise in domestic consumption should (1) cause cattle prices to rise to uneconomic levels and (2) leave progressively fewer animals available for export slaughter.

Officials of the Secretariat of Agriculture and Meat Board were more concerned over cattle supplies than the companies and with reason. Preliminary returns from the survey of cattle numbers made annually on June 30 revealed an alarming situation. The provisional total for 1958 was 40.7 million head, which was lower than the number reported in the 1947 census (*23*, p. 5). The country was consuming its patrimony. For this reason Agriculture opposed establishment of maximum prices on meat for domestic consumption. It favored curtailment of meat consumption, rather than encouragement. It tried to have the maximum price order repealed, and toward the end of July the Secretary announced that ceiling prices for meat had been eliminated throughout the country (*25b*, p. 13), which, however, did not mean Buenos Aires. He did not succeed where the Federal Capital and environs were concerned.

On July 31 the Secretary of Commerce announced that the effective date of the new price controls for meat in the Buenos Aires area had been postponed, but only provisionally (*24d*, p. 1). At a press conference on August 2 he asserted that the rise in meat prices had been much greater than it would have been if the advance in minimum prices announced in July had not been much larger than would have been necessary to compensate the producers.[21] Prices of meat in the preceding week were 131 per cent higher than in 1955. There were three causes of this increase, he continued: the recent modification of exchange rates for meat adopted in order to offset higher packing house costs [and the resumption of buying by the companies in the open market in consequence]; the normal [seasonal] contraction of shipments of lightweight cattle; and the preference of metropolitan consumers for the kind of meat produced by such cattle. His suggested solution was that the slaughter of breeding cattle and young animals be curtailed, that prices in the interior be adjusted to the indispensable minimum needed to stimulate cattle production, and, above all, that domestic consumption of beef be reduced by 20 per cent. Nevertheless, he announced guaranteed meat prices would go into effect both for the butchers and the public beginning with

[21] According to Horacio J. Noboa, the President of the National Meat Board, the new steer prices, to have been adequate, should have been 44 per cent higher; the "prudent" 30 per cent increase actually amounted to only 11 per cent in real terms of the 1956 peso (*24a*, p. 9).

August 7 (*24e*, p. 1). Whereupon the butchers staged a strike, which lasted for several days until the authorities suspended the maximum price order, but only temporarily (*4u*, p. 18). The President signed a decree on August 9 which established maximum prices for all essential foods. In the case of beef, the retailer would pay 8 pesos per kilo at wholesale, and the public 34 per cent more—30 per cent being the margin allowed the retailer and 4 per cent to compensate for waste and shrinkage (*26b*, p. 1). (The average prices of cattle, dressed weight, on sales to the packers and in Liniers auctions in July 1958 were 6.3 and 6.6 pesos, respectively. The wholesaler was the middle link in the sales chain between the packer and the retailers.)

Aside from the revision of exchange rates in July 1958, the authorities did nothing to forestall a recurrence of even greater deficits in the future; in fact, the price ceilings imposed in August turned out not to be the moving levels announced in July, but fixed prices (this statement is based on official data published subsequently; from press reports at the time one gains the impression that meat prices at the consumer level must have been somewhat higher than official averages [*4w*, p. 11]).

Throughout the remainder of 1958 the meat and packing house situation was turbulent. In one respect it was a manifestation of a general vociferous and bitter reaction against the changed attitudes of Frondizi and a resurgence of Peronista activity in the labor unions which were the stronghold of the reaction. In another respect the uneasy state of the meat industry was caused by inadequate supplies of cattle; the average of direct shipments to central packers and abattoirs and to the Liniers Market during the last five months of 1958 was 156,000 head per month lower than in the first seven months. The strongest recession occurred in direct sales, which in the last five months of the year totaled only 17,500 more than in January. The most precipitous drop occurred in August. Layoffs in the packing houses caused by shortages led to a general strike in one plant which lasted for a month, with the government paying the wages of absentee workers for the entire period (*25c*, p. 10).

Labor relations throughout the whole industry deteriorated during the remaining months of the year, with the leaders clamoring for nationalization or expropriation of the companies. Once again they were in financial difficulties because the advantages of the exchange concession of July were eroded by declining exports and the prices of cattle at Liniers auctions, which on December 6 averaged 148 per cent higher than on June 6 (the increase for steers was 152 per cent). Toward the end of November most companies were curtailing their market purchases, and one had stopped buying altogether. During the first week in December (*4v*, p. 19)

> the retail butchers' association . . . decided to suspend purchases of beef from the wholesalers, thus virtually and voluntarily going out of business for the time being. The main reason adduced for the decision was that, at the present high prices which the retailer has to pay the wholesaler, his prices to the public would inevitably provoke consumer-resistance, and the consequent contraction of sales would endanger his profit margin. It is stated that, among the steps the butcher trade would like to see taken are: 1) a system of ceiling

prices applicable to the Liniers cattle market; 2) price-marking for the different beef cuts at the wholesale trade stage, and 3) retail prices to be fixed at 30 per cent net above these wholesale prices.

The government again tried to iron out the situation, first by trying to induce packers to observe a gentlemen's agreement not to outbid each other in the cattle markets, with the expectation that cattle prices could be stabilized. This did not work, with the result noted in one headline that "Cows Jump Over the Moon" (*4x*, p. 15). Various other expedients were considered and announced: exports to the United Kingdom would be curtailed; slaughter for domestic consumption in the main cattle zone would be reduced to 30 per cent below the July 1958 record; Mondays and Fridays would be beefless days in restaurants.

It had all happened before, and looked as if the whole complex of costly controls was going to be revived. Then suddenly the government gave up. Everything was completely out of hand. It removed price controls on meat and exports, and abolished the multiple exchange system for most products; only the official steer grading system remained. For the first time in almost twenty years the meat packing companies were on their own.[22]

STATISTICAL APPENDIX

Table A is unorthodox in arrangement. The main purpose is to illustrate the interplay of official steer prices and auction prices in Argentina's chief cattle market. In order to facilitate direct comparison, the price columns are placed side by side in the middle of each section. A secondary purpose is to show influences on prices and of prices on sales; this is done by means of the column giving volume of sales, explanatory footnotes, and by textual elaboration.

Official steer schedules are not given because they are not comparable to

[22] As of March 1960 the Argentine government had paid 6,444 million pesos (*10*) to cover deficits stemming from Perón's intervention in the meat trade.

The following statement recapitulates payments reported to this point (in million pesos):

Clean-up Bond		3,957
National Economic Recovery Fund		
1955–56	2,724	
1957	879	3,603
May 27, 1957–April 30, 1958		
Packing house deficits		195
Payments authorized July 1958		189
Sub-total		7,944
Amount duplicated in National Economic Recovery Fund and Clean-up Bond totals		1,433
Total		6,511

This total is higher than the one given above, but the Clean-up Bond total is the upper limit authorized for expenditure on the various current meat accounts. Argentine packers included in the system of state subventions received 36 per cent of total subsidies reported by the Secretary of Agriculture to the Senate in August 1958. (Actually the comparison was between national and private companies; 2,127 million pesos for the former, and 3,809 for the latter [*24*, p. 3], practically all of which were foreign. At that time the audit of past payments had not been completed.)

Still outstanding are a part of the "15 per cent subject to audit" claims dating from 1946. Practically all of the indebtedness through 1954 has been settled and the claims for the years 1955 and 1956 have been worked out by the Meat Board (*23*, p. xii). These are being handled on a company-by-company basis, and those companies which have reached agreement with the National Meat Board as to their totals have received all but a relatively insignificant balance for which funds are not immediately available. Whether such payments as have been made to date are included in the report of total payments is not clear.

market prices, official prices being published in terms of pesos per kilo, dressed weight; market prices on the basis of live weight. Even if both were based on live weights, they cannot be compared on an annual basis. The market prices are weighted averages; the official are list prices applicable to grades whose bases tended to vary from schedule to schedule, and which in any event would give no idea of the proportion of total steer sales to which each grade applied. Furthermore, if all other things had been equal, there remains the fact that only in 1947, 1948, and 1957 did a single schedule apply throughout the year. With the exception of 1939—included in the table for the purpose of comparing the magnitude of sales—prices of steers sold by the producers directly to the packers are averages of total sales made at official prices. These averages are influenced by the composition of sales, which differ from year to year; illustrative of this point are those for 1947 and 1948, during which the same price schedule applied.

For the years 1945 through 1954, at least, the prices of cattle other than steers also were indirectly controlled by the invoice prices on meat exports issued to the exporting companies by the government; for the period May 1955–February 1957 the prices of all cattle sold directly to packers were fixed.

Official prices influenced Liniers prices because they were mandatory minima for auction purchases of steers by packers and abattoirs subject to the official price system, except from May 1955 through May 1957, when that rule was in abeyance for market operations. Even in those years the official prices had an indirect effect, in that the removal of price supports for sales made at auction caused producers to ship so many steers directly that there was a lively competition for the small number sold in the Liniers Market.

It is probably too obvious to point out that, in a market situation in which controlled prices and auction markets both operated, producers would favor the latter in periods of cattle shortages, and that auction prices would therefore rise above official levels. This was not the case, however, in 1945, 1946, 1950, and 1953. Special circumstances prevailed in each of these years. Despite a drop in 1945 and 1946 of 500,000 head in the combined cattle offerings at Liniers and to central packers below the 1944 record, the market average was lower than the official because lengthy port and packing house strikes caused the packers to curtail market purchases. Suspension of meat exports to the United Kingdom from late July 1950 through April 1951 produced the same reaction in 1950. Cattle offerings through both outlets in 1953, though 400,000 above those of 1952, nevertheless were at the same level as in 1945 and 1946. It was in 1953 that the government decided to raise official prices high enough to revive direct sales, and to make official prices maxima for all steer sales, whether direct or at auction. Unquestionably the recovery of cattle numbers, as reflected in the increase in offerings during the year, was responsible for the belated success of the efforts to stabilize prices.

The developments responsible for price disparities between 1957 and 1958 have been discussed so recently as not to require recapitulation. The influence of these developments is not clearly discernible from the averages in Table A, and for that reason monthly averages are used in Tables B and C for the purpose of timing the developments and the reaction to them.

TABLE A.—DIRECT AND LINIERS MARKET SALES AND AVERAGE PRICES, ALL CATTLE AND STEERS, 1946–1958*

Year	Steers				Cattle			
	Direct, Central Packers		Liniers Market		Direct, Central Packers		Liniers Market	
	Million head	Pesos/kg live wt.	Pesos/kg live wt.	Million head	Million head	Pesos/kg live wt.	Pesos/kg live wt.	Million head
1939	1.9	0.257	0.238	0.5	2.0	0.252	0.230	2.3
1945	0.8	*0.383*[a,b]	0.378	0.7	0.9	0.376	*0.377*	2.2
1946	0.9	*0.430*[c]	0.410	0.6	1.3	*0.398*	0.385	2.6
1947	0.9	*0.502*	0.497	1.0	1.6	0.463	*0.478*	3.4
1948	0.7	0.517	0.527	0.9	1.2	0.490	*0.527*	3.5
1949	0.8	0.613[d]	0.627	0.8	1.2	0.579	*0.619*	3.5
1950	0.7	*0.754*[e]	0.753	0.9	1.4	0.671	*0.720*	3.6
1951	0.4	1.167[f]	*1.197*	0.9	0.9	1.082	*1.154*	2.8
1952	0.4	1.589[g]	*1.685*	0.7	1.1	1.596	*1.621*	2.7
1953	0.8	*2.077*[h]	1.971	0.7	1.1	*1.974*	1.937	2.0
1954	1.6	*2.144*[i]	2.046	0.7	2.0	*2.072*	1.925	1.7
1955	2.0	*2.297*[j]	2.037	0.3	3.5	*2.115*	1.867	1.6
1956	2.6	*2.898*[k]	2.625	0.3	4.6	*2.648*	2.280	1.8
1957	2.0	*3.096*	2.730	0.7	3.1	*2.802*	2.518	3.1
1958	1.3	*3.470*[l]	4.776	1.3	1.6	*3.321*	4.041	4.2

* Argentina, Junta Nacional de Carnes, *Reseña Año 1957*. "Apendice Estadístico: Comercio Interno" (n.p); ———, *Reseña Año 1958*, pp. 145, 147, 160.

[a] Italics indicate higher comparative price.

[b] Reflects new official steer prices, effective as of June 18, 1945, which ranged 1-10 per cent higher than previous schedule (in force since Jan. 3, 1944), with an average increase of 6 per cent for all grades on a dressed weight basis.

[c] A new steer schedule, effective as of October 1, 1946, raised prices from 22-36 per cent depending on grade and weight, with an average of 28.8 per cent.

[d] The first change in steer prices since 1946 became effective as of April 1, 1949 (as in the case of the two previous schedules mentioned above, the decree authorizing the new prices was made later in the year than the effective date—in this case on August 8, 1949—with retroactive application). Increases ranged from 26 per cent in the lowest grades to around 39 per cent in the two top grades, which included the greater part of the meat produced. Because of the penalties for over-weight within grades, it is useless to attempt an over-all average.

[e] Official steer prices were raised on June 6, 1950 by around 23 per cent in the top grades, and were revised on August 21 to favor lower weights within grades.

[f] Prices of steers at the desired weight limits for the two top grades were increased by 48 per cent on July 1, 1950; only token increases were granted in the lower grades.

[g] A further increase of 21 per cent in all but the bottom grades went into effect on January 1, 1952, and another of around 3.4 per cent on May 15. On October 10, 1952 another schedule was issued using the same maximum prices per grade established in the May schedule but, by raising the desired weight, making steers that had been penalized for excess weight in the four preceding schedules eligible for the top prices per grade.

[h] Steer prices were advanced twice in 1953: the first time on January 1; the second on March 26, which brought official prices to levels around 32 per cent higher than in the last 1952 schedule.

[i] The desired weight level was lowered on February 2, 1954, and a token price increase was made for steers in the favored range. Those which weighed in excess of the maximum favored weight in the new list brought lower prices than in the preceding schedule.

[j] An increase averaging around 6 per cent went into effect on September 1, 1955, and another, averaging 13 per cent, on December 12, 1955.

[k] Official steer prices were raised on an average of 20 per cent as of May 29, 1956.

[l] A 30 per cent advance went into effect as of June 23, 1958.

TABLE B.—STEER PRICES, DIRECT AND LINIERS MARKET PURCHASES, MONTHLY AVERAGES, 1957–58*

Year and month	Direct purchases[a]			Liniers sales[b]		
	Live weight (*pesos/kg*)	Yield[c] (*per cent*)	Dressed weight[d] (*pesos/kg*)	Live weight (*pesos/kg*)	Yield[c] (*per cent*)	Dressed weight[d] (*pesos/kg*)
1957 Jan.	3.098	60.3	5.138	2.562	56.8	4.511
Feb.	3.085	60.4	5.108	2.647	56.9	4.652
Mar.	3.091	60.1	5.143	2.600	57.1	4.553
Apr.	3.004	59.4	5.057	2.545	56.7	4.489
May	3.061	60.6	5.051	2.905	57.5	5.052
Jun.	3.154	60.0	5.257	3.060[e]	58.2	5.258
Jul.	3.051	60.4	5.051	2.892[e]	58.0	4.986
Aug.	3.082	60.3	5.111	2.737[e]	57.7	4.743
Sep.	3.133	61.2	5.119	2.811[e]	59.8	4.701
Oct.	3.162	61.1	5.175	2.816[e]	59.1	4.765
Nov.	3.179	61.3	5.186	2.666[e]	59.3	4.496
Dec.	3.121	61.0	5.116	2.485[e]	59.9	4.148
Average	3.096	60.5	5.117	2.730	58.4	4.675
1958 Jan.	3.130	61.8	5.064	2.609[e]	59.6	4.377
Feb.	3.096	60.9	5.084	2.739[e]	58.4	4.690
Mar.	3.059	60.5	5.056	2.841[e]	57.6	4.932
Apr.	3.011	59.8	5.035	2.965	57.6	5.148
May	3.008	59.6	5.047	3.132	58.3	5.372
Jun.	3.082	58.2	5.291	3.384	58.9	5.745
Jul.	3.983	61.0	6.530	3.978	57.8	6.882
Aug.	4.072	61.2	6.654	4.644	58.7	7.911
Sep.	4.672	62.1	7.523	4.697	59.1	7.948
Oct.	4.818	61.9	7.784	4.960	59.1	8.393
Nov.	4.968	61.0	8.144	5.885	59.2	9.941
Dec.	8.460	58.7	14.412	8.671	59.0	14.697
Average	3.470	60.7	5.717	4.776	58.7	8.136

* Argentina, Junta Nacional de Carnes, *Reseña Año 1958*, pp. 91, 145, 147.

[a] Average of purchases at official minimum prices.

[b] Average of Liniers Market auction prices.

[c] Computed. According to the National Meat Board, the yield—i.e., the relation of dressed weight to live weight—of cattle sold directly to packers and those sold at auction is not strictly comparable because, under Argentine law, cattle shipped directly from producer to packer are weighed immediately after leaving the train, while cattle sold in markets usually are fed and watered upon arrival, before weighing. Consequently, dressed weight of animals of approximate grades and weights is lower in the case of market purchases than in the case of direct shipments by comparison with the live weight tonnage.

[d] Dressed weight at the slaughter floor corresponds to the following preparation: the head is separated above the first cervical vertebra; the lower leg is cut at the second joint between the hock and the knee; the tail is separated below the first vertebra; the diaphragm, kidneys, and the fat of the kidneys, pelvis, pelvic canal, and, in the case of cows, the udder, adhere to the carcass.

[e] Under the "compensation price" formula set up by the decree law of May 27, 1957, as elaborated by the National Meat Board, the prices of steers sold at auction were averaged at the end of each day and, in the case of those which had sold at prices below the average, the purchaser, if subject to the official price system, was required to make up the difference between the purchase price and the average. Bonuses thus paid averaged as follows, in pesos per kilogram live weight:

1957	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
	.010	.049	.080	.078	.092	.210	.328
1958	Jan.	Feb.	Mar.				
	.238	.098	.013				

Since these are averages for all steers sold, and not alone those to the packers and abattoirs required to pay official prices, the bonuses paid by the latter were higher than those listed above, and hence have not been used in figuring dressed weight prices.

[f] A 30 per cent advance went into effect as of June 23, 1958. Prices of steers at the desired weight limits for the two top grades were increased by 48 per cent on July 1, 1950; only token increases were granted in the top grades, and were revised on August 21 to favor lower weights within grades. 1950.

TABLE C.—CATTLE PRICES, DIRECT AND LINIERS MARKET PURCHASES, MONTHLY AVERAGES, 1957–58[a]

Year and month	Direct purchases[a]			Liniers sales[b]		
	Live weight (*pesos/kg*)	Yield[c] (*per cent*)	Dressed weight[d] (*pesos/kg*)	Live weight (*pesos/kg*)	Yield[c] (*per cent*)	Dressed weight[d] (*pesos/kg*)
1957 Jan.	2.820	58.5	4.821	2.289	55.2	4.147
Feb.	2.812	58.8	4.782	2.340	55.7	4.201
Mar.	2.833	58.9	4.810	2.352	55.3	4.253
Apr.	2.764	58.1	4.757	2.283	55.0	4.151
May	2.614	57.9	4.515	2.618	55.2	4.743
Jun.	2.718	57.5	4.727	2.694[e]	56.0	4.811
Jul.	2.665	57.6	4.627	2.569[e]	56.0	4.477
Aug.	2.702	57.9	4.667	2.495[e]	55.5	4.495
Sep.	2.858	59.4	4.811	2.674[e]	56.8	4.708
Oct.	2.974	59.9	4.965	2.643[e]	56.9	4.645
Nov.	2.944	59.9	4.915	2.487[e]	57.4	4.333
Dec.	2.950	59.9	4.925	2.445[e]	58.0	4.215
Average	2.802	58.7	4.773	2.518	56.2	4.480
1958 Jan.	2.981	60.8	4.903	2.555[e]	57.5	4.443
Feb.	2.955	59.9	4.933	2.610[e]	55.9	4.669
Mar.	2.928	59.6	4.913	2.561[e]	54.6	4.690
Apr.	2.878	58.8	4.895	2.694	54.5	4.943
May	2.860	58.3	4.906	2.789	54.8	5.089
Jun.	2.859	56.3	5.078	3.005	55.3	5.434
Jul.	3.745	59.5	6.294	3.665	55.3	6.627
Aug.	3.875	59.3	6.535	4.396	56.8	7.739
Sep.	4.512	60.8	7.421	4.496	57.2	7.860
Oct.	4.760	61.2	7.778	4.891	57.4	8.521
Nov.	4.908	59.9	8.194	5.717	58.0	9.857
Dec.	7.665	56.7	13.519	8.379	57.8	14.497
Average	3.321	59.5	5.582	4.041	56.3	7.178

[a] Junta Nacional de Carnes, *Reseña Año 1958*, pp. 92, 145, 147.
[a–d], inclusive: same as in Table B.
[e] On the basis of total cattle sales, the premium paid by packers on steers purchased at auction at prices below the official minima (see footnote *e*, Table B) brought up the average cattle prices for the months indicated by the following amounts (pesos per kilogram, live weight):

1957	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
	.002	.013	.018	.023	.034	.091	.143
1958	Jan.	Feb.	Mar.				
	.093	.029	.003				

A glance will suffice to inform the reader that these two tables are to be used to illustrate other matters than the one already alluded to. They are intended to serve two purposes, the second of which will be discussed later. For the moment, our concern is with the first and fourth statistical columns in both tables, but first an explanatory digression.[23]

It will be recalled that on February 27, 1957 the Provisional Government abolished the meat subsidy in Buenos Aires and suburbs and removed ceiling prices on all cattle except steers. Retail meat prices, which had been virtually unchanged since 1953, moved up rapidly through June. In a list of prices of six

[23] The dressed weight prices are merely live weight prices divided by the yield; they represent no difference in the return to the producer.

representative cuts published regularly by the government statistical office, the June 1957 averages ranged from 52 per cent for rump roasts to 176 per cent for soup bones above those of December 1956. Buyer resistance began to make itself felt in July, and prices fell throughout the last six months of the year, when a recovery set in, which through April was considered steep but which nevertheless left prices lower than in the previous June. Came May 1958 with a 60 per cent wage increase, with the dual effects on demand and prices already discussed, and July with a 30 per cent average advance in steer prices. The rise in retail prices led to reimposition of ceilings on meat prices to the consumer in August.

In order to compare the advances of cattle and steer prices in the Liniers Market auctions and direct sales with those of meat, the price of *asados*[24] was selected because it is the closest to the mean of the six beef cuts for which price series are published by the government statistical office and is also quite consistent in its relationship with the total of other prices throughout 1957 and 1958 (*27a*). The comparison is in terms of percentage increases (steer prices are included because they are an important component of the cattle price average, because they continued to be fixed for direct sales, and because, after revision of the national meat law on May 24, 1957, they were once more minima for auction purchases by the companies subject to the official grading and price system).

Period	Asado	Cattle		Steers	
		Direct Sales	Liniers Market	Direct Sales	Liniers Market
Jan. 1957–Jun. 1957	70	(–4)	18	2	20
Jan. 1957–Dec. 1957	53	5	7	1	(–3)
Jan. 1957–Apr. 1958	59	2	18	(–3)	16
Apr. 1958–Aug. 1958	61	35	63	35	57
Apr. 1958–Nov. 1958	58	70	112	65	99
Apr. 1958–Dec. 1958	120	166	212	181	192

The previous tabulation compared the advance of list prices of the *asado* with weighted averages of cattle and steer prices, live weight. That which follows gives average list prices of the beef roast in pesos per kilo (*27*) and then shows the percentage differential between weighted averages of prices (dressed weight basis) of cattle sold directly to central packers and abattoirs and in Liniers Market auctions (Table C):

Month	Asado		Asado prices as per cent of cattle prices			
			Direct sales		Liniers Market	
	1957	1958	1957	1958	1957	1958
Jan.	4.80	7.34	99	150	116	165
Feb.	4.88	7.44	102	151	116	159
Mar.	6.95	7.46	144	152	164	159
Apr.	6.96	7.65	146	156	168	155
May	7.09	8.45	157	172	150	166
Jun.	8.16	8.82	173	174	170	162
Jul.	8.19	10.86	177	173	183	164
Aug.	8.10	12.29	173	188	180	159
Sep.	7.71	11.73	160	158	164	149
Oct.	7.62	11.76	154	151	164	138
Nov.	7.37	12.10	150	148	170	123
Dec.	7.34	16.82	149	124	174	116

[24] *Asado* means "roasted." The cut known as the *asado* is the short-rib section of a side of meat.

The margins would be wider if an average of all retail meat prices could be given, but such averages are available only in the annual series. (For 1957 and 1958 they average around 16 per cent lower than the monthly series used.) On the other hand, the margin would be narrowed by the bonus on sales indicated by note *e*, Tables B and C. At best, the tabulation can be no more than suggestive.

Between the cattle producer and the consumer lie three stages: the processor, the wholesaler, and the retailer. From the price paid to the producer, the processor deducts credits for by-products; to the balance he adds processing costs, allowance for shrinkage, overhead, profits, taxes, etc. The only figures I have that pertain to this process are for chiller grade steers in August 1958, after the 60 per cent wage increase and 30 per cent price increase were in effect; these indicate that, without making allowance for profits and taxes, approximately 20 per cent was added in the course of processing to the prices paid by the processor to the producer. The only other datum is the 34 per cent increase over and above the wholesale price which the retailer was allowed to collect by the August 1958 decree. Even with two unknowns—packers' profits and taxes and the amount above the packers' price added at the wholesale level—at least 60 per cent was added to the dressed weight price of the cattle. Even with this smattering of information it is difficult to see how the domestic trade could have been profitable to the entrepreneurs after May 1957, although they certainly must have been able to do fairly well during the ten months March–December 1957. If that were the case, how does one explain the bonuses paid by the government in each of the ten months beginning with June 1957? The unit prices on Liniers purchases, as shown in Table D, suggest an answer.

In each of the ten months the average of prices paid by the National Packing House of Buenos Aires for purchases on its own account was higher than the Liniers average on total sales; in eight months of the ten the same was true of CAP and the abattoirs (column *a*) required to pay official prices for steers. Steer purchases by the private packers may occasionally have gone above the daily average, but the comparative low monthly average of prices paid by them during that period suggests that their Liniers purchases were largely composed of cattle other than steers. This further suggests that the packing house subsidies paid by the government in June 1958 to cover deficits incurred between May 1957 and April 1958 went almost entirely to Argentine companies, unless there were also losses on export sales. The unit prices of meat exports in Table E do not lead to such an inference, when compared to the dressed weight prices in Tables B and C.

Exported meats require a larger degree of preparation, handling, and packaging than those that move directly into local markets, especially since most meat produced for local consumption in Argentina is sold within a short radius of the place of slaughter. Handling, shipping, and ancillary expenses add still more to purchase prices. Taxes on exported meat are much higher than on that sold at home. Steer meat, and especially the more expensive grades, comprises a larger proportion of exports than is comprehended in the weighted averages of total sales. The tonnage exported includes packaging, which in the case of canned meat contributes probably more to total weight than is compensated by loss of weight from the dressed weight equivalent in meat shipped on a bone-out basis.

TABLE D.—ARGENTINA: CATTLE PURCHASES, LINIERS MARKET, VOLUME AND UNIT PRICE, 1957, 1958*

TABLE D.—ARGENTINA: CATTLE PURCHASES, LINIERS MARKET, VOLUME AND UNIT PRICE, 1957, 1958*

Year and month	Volume (*1,000 head*)						Unit Price (*pesos/kg, live weight*)					
	Total	CAP	Private packers	Nat'l Frigrifico	Abattoirs (a)	Abattoirs (b)	Total	CAP	Private packers	Nat'l Frig.	Abattoirs (a)	Abattoirs (b)
1957 Jan.	157	25	30	48	21	33	2.29	2.37	2.35	2.41	2.40	1.92
Feb.	147	32	26	38	23	28	2.34	2.49	2.16	2.53	2.54	1.98
Mar.	217	41	35	71	31	39	2.35	2.35	2.33	2.52	2.43	2.12
Apr.	227	34	27	71	28	67	2.28	2.27	2.15	2.45	2.43	2.10
May	290	45	75	72	36	62	2.62	2.63	2.43	2.91	2.78	2.35
Jun.	316	48	84	65	33	86	2.69	2.86	2.50	3.00	2.90	2.19
Jul.	301	42	59	67	34	99	2.60	2.62	2.31	2.84	2.80	2.43
Aug.	272	31	55	51	36	99	2.50	2.42	2.01	2.87	2.76	2.44
Sep.	287	30	48	76	31	102	2.67	2.57	2.29	2.98	2.87	2.64
Oct.	322	46	48	83	24	121	2.64	2.67	2.21	2.93	2.68	2.71
Nov.	285	50	42	64	22	107	2.49	2.60	2.15	2.77	2.47	2.46
Dec.	284	34	36	58	23	133	2.45	2.46	2.15	2.76	2.44	2.34
Total or average	3,106	459	564	764	341	978	2.52	2.55	2.28	2.77	2.65	2.20
1958 Jan.	330	44	50	68	27	141	2.56	2.62	2.25	2.84	2.63	2.46
Feb.	283	32	44	59	34	114	2.61	2.64	2.22	2.86	2.73	2.60
Mar.	324	33	64	62	40	125	2.56	2.62	2.10	2.80	2.72	2.51
Apr.	366	33	84	69	30	150	2.69	2.81	2.27	2.94	2.89	3.54
May	400	38	111	64	34	153	2.79	3.01	2.46	3.03	2.97	2.48
Jun.	437	49	139	70	30	149	3.01	3.35	2.81	3.22	3.08	2.59
Jul.	386	44	86	64	39	153	3.67	3.87	3.27	4.00	3.82	3.29
Aug.	312	45	59	70	27	111	4.40	4.54	4.03	4.81	4.39	4.23
Sep.	316	35	43	88	32	118	4.50	4.71	4.14	4.80	4.52	4.33
Oct.	355	47	63	99	37	109	4.89	4.93	4.74	5.06	4.87	4.85
Nov.	340	45	90	82	35	88	5.72	5.72	5.85	5.91	5.53	5.59
Dec.	363	45	121	93	22	82	8.38	8.75	8.45	8.75	8.21	7.59
Total or average	4,213	489	953	887	387	1,497	4.04	4.28	4.01	4.51	3.99	3.42

* Argentina, Junta Nacional de Carnes, *Reseña Año 1958*, p. 149.
a Subject to official price system.
b Concessionaires of National Packing House and slaughter yards of Buenos Aires and suburbs.

TABLE E.—ARGENTINA, MEAT EXPORTS, MONTHLY, 1957–1958*

Year and month	Volume (*1,000 tons*)	Value (*million pesos*)	Value ($*1,000 U.S.*)	Unit price[a] (*pesos/kg*)	Exchange rates[a] (*pesos/$*)
1957 Jan.	51.3	531.1	28,157	10.35	18.8
Feb.	49.5	379.1	20,147	7.66	18.8
Mar.	53.8	429.5	22,985	7.98	18.7
Apr.	50.0	396.8	20,724	7.94	19.2
May	46.6	394.9	20,549	8.47	19.2
Jun.	41.1	396.7	19,961	9.65	19.9
Jul.	50.1	435.4	21,408	8.69	20.3
Aug.	55.1	466.2	23,218	8.46	20.1
Sep.	47.1	449.5	21,736	9.54	20.7
Oct.	47.3	440.5	20,849	9.31	21.1
Nov.	58.1	482.8	24,225	8.31	19.9
Dec.	51.0	409.0	20,888	8.02	19.6
Total or average	601.0	5,055.9	256,584	8.41	19.7
1958 Jan.	60.3	474.6	24,700	7.87	19.2
Feb.	50.5	404.5	20,757	6.71	19.5
Mar.	54.2	449.9	23,192	8.30	19.4
Apr.	57.0	485.6	24,502	8.52	19.8
May	58.9	599.7	29,070	10.18	20.6
Jun.	64.1	648.7	31,122	10.12	20.8
Jul.	52.8	555.1	25,881	10.51	21.4
Aug.	49.0	610.1	22,652	12.45	26.9
Sep.	40.3	644.0	20,546	15.98	31.3
Oct.	48.4	808.8	23,241	16.71	34.8
Nov.	53.4	874.7	22,849	16.38	38.3
Dec.	56.6	1,024.2	26,839	18.10	38.2
Total or average	645.4	7,579.7	295,351	11.77	25.7

* Argentina, Dirección Nacional de Estadística y Censos, *Boletin Mensual de Estadística*, January 1958–July 1959.
[a] Calculated.

Nevertheless, steer meat made up around 65 per cent of the export weight of total meat exports in 1957 and 1958, including mutton and pork, and 75–80 per cent of refrigerated shipments. Even so, the margin between dressed weight steer prices seems to have been wide enough to have covered the excess costs mentioned and still have returned profits for the period under immediate purview, as well as for the last seven months of 1958, after the advance in all cattle and meat prices arising from the expansion of earning power in May 1958 and the advance in steer prices as of late June. This would not have been true without the revision of the exchange rate structure for meat exports introduced on August 1, 1958 (65 per cent at 18 pesos/$1 U.S.; 35 per cent at the open market rate).

Because of the larger volume they were equipped to process, the greater efficiency of their operations, and established export markets, the companies which participated most actively in the export trade were in a much better financial position than those which served the domestic market almost exclusively. Yet it was the private firms that were the most cautious in their bidding in Liniers

Market auctions, and those which chiefly served the domestic market that were most active in bidding up prices. The more favorable prices obtainable at Liniers, partially a consequence of their bids, led producers to prefer to sell there, rather than directly to packers at controlled prices—a recurrence of what had occurred between 1947 and 1953. Direct sales, which fell off somewhat in May 1958, plummeted after July, forcing packers to buy most of their requirements at auction (see Table F). To the extent possible, they reduced their slaughter for con-

TABLE F.—CATTLE AND STEER SALES TO CENTRAL PACKERS AND IN LINIERS MARKET, MONTHLY AVERAGES, 1957–58*
(*Thousand head*)

Year and month		Cattle		Steers	
		Liniers	Direct	Liniers	Direct
1957	Jan.	157	435	44	233
	Feb.	147	391	36	212
	Mar.	217	267	32	183
	Apr.	227	258	31	177
	May	290	264	43	161
	Jun.	316	176	64	108
	Jul.	301	210	63	128
	Aug.	272	271	49	172
	Sep.	287	188	70	134
	Oct.	322	187	100	145
	Nov.	285	229	104	170
	Dec.	284	186	101	148
1958	Jan.	330	278	106	225
	Feb.	283	222	69	181
	Mar.	324	235	64	195
	Apr.	366	225	61	185
	May	400	147	77	114
	Jun.	437	106	114	76
	Jul.	386	138	94	109
	Aug.	312	64	108	47
	Sep.	316	64	115	51
	Oct.	355	97	141	83
	Nov.	340	54	159	44
	Dec.	363	18	194	12

* Argentina, Junta Nacional de Carnes, *Reseña Año 1958*, pp. 145–47.

sumption, which by November 1958 could not have been conducted at other than a loss. The bigger export earnings made possible by the downward slide of the free market rate of the peso appear to have offset losses on the domestic trade until November, when all the companies were being pinched between the high level of cattle prices and the ceilings on retail beef.

For two reasons, this statistical appendix has dwelt on the details of the years 1957 and 1958: (1) they are the only two years for which all of the details presented are available on a monthly basis; (2) they cover the two most crucial years of the Argentine government's attempts to eliminate the crippling subsidies with

which it had been burdened by the Perón policies and its own mistakes, while at the same time attempting to maintain controls adopted earlier for the purpose of regulating the foreign-owned companies.

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R. J. HAMMOND

BENEFIT-COST ANALYSIS AND WATER-POLLUTION CONTROL IN THE UNITED STATES: A NOTE*

A HISTORICAL SURVEY

Benefit-cost analysis and the embodiment of its results in a benefit-cost ratio had their origins in United States Federal Government practice, having been used by the Army Corps of Engineers for over fifty years in connection with river and harbor improvements. They constituted an administrative device which owed nothing in its origins to economic theory, and until the early nineteen-thirties were applied only to tangible costs and benefits. However, when the Great Depression led to attempts to revive the national economy by massive public works, the evaluation techniques currently in use appeared to be unduly restrictive. In 1934 the Water Resources Committee of Secretary Ickes' National Resources Board recommended the extension of benefit-cost analysis to intangible factors, and in particular to take into account the benefits of employing "creatively" labor that might otherwise be idle and maintained at public expense. In 1936 the Flood Control Act empowered the Federal Government to participate in flood control schemes "if the benefits to whomsoever they may accrue are in excess of the estimated costs, and if the lives and social security of people are otherwise adversely affected." Thenceforth the practice of making benefit-cost analysis, and with it an increasing attention to intangibles, more particularly on the side of benefits, spread over the whole field of water development.

No attempt was made before World War II to secure consistency in the practices of various agencies, and when large-scale economic projects, calling for high federal expenditures, were resumed after the war, the methods of analysis employed were found to be widely divergent. Moreover, with large-scale unemployment apparently a thing of the past, the attitude of Congressional and public opinion became increasingly critical of inconsistencies all of which seemed calculated to increase the burden on the federal taxpayer. From about 1950 onward, professional economists began to take a sustained interest in benefit-cost

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questions, and a substantial literature developed. Controversy centered mainly on indirect or secondary benefits and the extent to which intangibles might be admitted.

In 1946 the Federal Inter-Agency River Basin Committee appointed a sub-Committee on Benefits and Costs for the purpose of formulating mutually acceptable principles and procedures. This Committee still exists under another name. In May 1950 it produced an interim report—commonly known as the "Green Book"—which was welcomed by economists as a step forward in the rational treatment of benefit-cost problems. But this did not end controversy between agencies or criticism from outside commentators, and it seems fair to describe the work of the Committee as having reached an impasse. This is principally, perhaps, because no agency is willing to give up practices which ensure it "satisfactory" benefit-cost ratios—i.e., in excess of unity. The Bureau of Reclamation more especially has come under criticism for illogical methods of analysis, but no agency has been immune from attack. Contrariwise, efforts by the Bureau of the Budget to secure uniformity have themselves aroused Congressional criticism as "usurpation of the legislative power," but the expressed intention of the Senate to promulgate fresh criteria has so far not materialized.

CRITIQUE OF CURRENT APPROACH TO BENEFIT-COST ANALYSIS

Most unofficial criticism of the impasse into which officially employed benefit-cost analysis has fallen suggests that political factors are to blame and that but for these the analysis would provide a satisfactory means of evaluating water projects. This belief does not appear to be warranted. The pronouncements of the sub-Committee on Benefits and Costs, as embodied in the "Green Book," are in principle unsatisfactory because they purposely eschew any practical administrative reference, and may thus be stigmatized as academic: moreover, even on their own chosen plane they display serious weaknesses of treatment. It is advised, for instance, that agencies should seek, for any given project, the maximum excess of benefits over costs, regardless of the amount of the costs: a recommendation likely to lead to the development of fewer projects yielding diminishing returns. In considering costs, no distinction is drawn between capital investment and current expenditure, so that the resultant benefit-cost ratio discriminates against projects having high levels of both current expenditure and income, compared with the capital investment involved. This is not only undesirable in itself, but inconsistent with the Committee's own assertion that the excess of benefits over costs is all that matters.

Another weakness of the sub-Committee's recommendations is the extent to which they are prepared to advocate the use of imaginary data (long-term projections and the like) in economic evaluation. This is particularly noticeable in the discussion of the effects of water-development projects on recreation, fish, and wildlife, in which the recommended methods resort almost wholly to imaginary data and must therefore lead to imaginary results. But critics of the sub-Committee have sometimes recommended even more extensive recourse to imaginary data. A report to the Bureau of Reclamation in June 1952 pointed out that consideration of a particular project logically involved not merely the alternative uses of the particular resources in question, but "any alternative uses made of any

of the Nation's available resources." The writer regards this dictum as a *reductio ad absurdum* of the claims made in some quarters for benefit-cost analysis and concludes that such large claims should be rejected.

A more limited field for benefit-cost analysis, firmly related to administrative needs, would appear desirable. Benefit-cost evaluations should be embarked on only when the scale of the project justifies their cost in effort and expense; furthermore, the viewpoint from which they are undertaken should likewise be appropriate to that scale, that is to say, in general local rather than nation-wide. Particular care needs to be taken to avoid confusing transference of economic gains with net national benefit. Some benefits that are largely intangible—for instance, those connected with recreation, fish, and wildlife—might be better excluded from an analysis which seeks to evaluate investment. Instead they might be treated as items of collective consumption. If for any reason it is thought necessary to bring recreational benefits within the scope of a benefit-cost evaluation, the least objectionable course would be to set up a notional user-charge, multiply it by the number of users (suitably diminished to allow for the deterrent effect of such a charge), and treat it as the measure of income forgone by the decision not to levy an admission fee. The author, however, regards this as a second-best solution.

As for "secondary" or "indirect" benefits, many critics have recommended their total exclusion from project analysis, on the ground that they are "ramifying, involved, and conjectural." But this objection loses force if one follows the course earlier suggested and evaluates most projects not nationally but locally. Such benefits should, however, never be lumped with primary direct benefits into a single benefit-cost ratio, for this is illogical and misleading. So too a limited approach to project analysis makes it possible to treat the actual rate at which the responsible agency expects to borrow as the most appropriate interest rate at which to compute long-term annual costs. (It has been argued that a higher interest rate, based on opportunity costs, would better represent the social cost of public works; but any such rate would be necessarily arbitrary and moreover involves the doubtful assumption that competitive private uses for capital are entitled to the same consideration, from the point of view of the public interest, as government-sponsored projects.)

This more limited, more practical approach to the problem would, in the author's opinion, serve to rehabilitate a useful but limited administrative tool that has fallen into discredit through overstrain.

THE CHARACTER OF THE WATER-POLLUTION PROBLEM

The disposal of wastes is but one of many competing uses to which man puts water, and it may be said to participate in other uses, such as drinking, ablution, fishing, manufacture, and power generation. Like most of these other uses, it is not consumptive and in this contrasts sharply with irrigation, which results in heavy evaporation losses (up to 70 or 80 per cent in arid regions). Most water uses, in fact, involve not consumption but alteration of water. Whether this alteration constitutes pollution depends on its nature and extent, on the previous state of the water, and on the purposes for which the water is subsequently required. Pollution may be either organic, by wastes that decompose in the

presence of oxygen and hence are "self-purifying," or inorganic, tending to become more concentrated as a result of evaporation. The disposal of wastes by water hence involves the use of two resources: the water itself as a diluent (and as a means of transporting wastes elsewhere), and its dissolved oxygen as a reagent. The water needs for diluting wastes are very large. Raw city sewage, for instance, needs to be diluted with some forty times its own volume of water if the dissolved oxygen in the receiving waters is not to fall below the level generally considered safe for maintaining aquatic life. Some types of trade waste make demands many times as great.

The growth of industry and population in the United States was bound eventually to overtax the waste-disposal resources and call for remedial measures, whether by waste treatment or flow regulation. But phenomena such as destruction of fisheries or other wildlife cannot invariably and with certainty be attributed to water pollution, and (in the words of the U.S. Government's Committee on Water Pollution in 1939) "estimates of the economic consequences are both difficult and hazardous." Even more difficult may be the apportionment of economic responsibility in individual instances where the equilibrium of water use has been disturbed and symptoms of pollution have resulted. Moreover, there are some instances where physical pollution of water has existed for generations and may be said to have been condoned. In such a case it cannot be said that the abatement of pollution will *ipso facto* restore a valuable natural resource, such as oyster-beds, that has been unusable for a considerable time; for new resources will have been developed to replace it and the demand for it may never revive. Indeed, it is always *possible* to argue that a polluter creates more economic wealth than he destroys.

APPLYING THE ANALYSIS

The existing U.S. federal law on water pollution appears to offer little scope for benefit-cost analysis (by the Federal Government). This is partly because the federal authorities must approve state-sponsored plans conforming with statutory conditions, partly because the apportionment of federal funds between states has to be made on grounds other than those of economic efficiency, partly because the scale of the projects, and of federal aid, is so small as not to warrant deploying the whole armory of economic analysis.

Such analysis might, however, be appropriate at the local level. So far as city sewage treatment is concerned, an adequate analysis of costs is simple, the more so since one would not be justified in pursuing it into the realm of secondary or indirect effects. But difficulties begin to arise almost immediately on the side of benefits. Such of these as the reduction in water-treatment costs to downstream users, or restoration of commercial fisheries, may indeed be capable of estimation. All else, however, is speculative. The benefits to public health, for instance, may well be negligible, bearing in mind that epidemic outbreaks attributable to bathing in polluted waters have over the past fifty years been extremely rare. As for the intangibles, such as public enjoyment of a clean stream, these seem unlikely generally to contribute much toward providing projects with a favorable benefit-cost ratio.

It can, of course, be argued that projects should not be evaluated separately

but as part of a comprehensive water-pollution abatement program, conferring regional or even national benefits. But to pursue this course might lead to difficulties in justifying the completion of such programs as that for the Ohio River Basin. There is bound to come a time when the contribution of the outstanding projects, in terms of investment and return, might be considered negligible, even though on grounds of public policy—such as the enforcement of equitable standards of treatment on all water authorities—it were regarded as desirable that the program should be carried through. Indeed, the whole concept of an all-out campaign against water pollution is at variance with the notion of the most efficient use of resources embodied in benefit-cost analysis.

The difficulties in applying the analysis to municipal treatment of sewage and industrial waste lie wholly on the side of benefits. For wastes treated by industry itself they extend to the estimation of costs also, inasmuch as treatment forms part of a manufacturing process. The apportionment of joint charges, particularly overheads, between different sections of a business must necessarily be arbitrary, and firms would be tempted to exploit this situation in arguments with water-pollution control authorities. In order to guard against exaggerated estimates of water-treatment costs, it would be necessary for such authorities to employ their own investigating accountants—a costly, time-consuming, and perhaps inconclusive procedure. It is noteworthy that the costs of waste treatment appear to be much more onerous where alterations to existing factories are called for than in instances where completely new factories are being set up; this offers scope for a gradual and comparatively painless tightening-up of industrial waste regulations.

To one form of pollution abatement benefit-cost analysis has already been applied in the United States—that arising from the construction of multiple-purpose dams, having as an incidental result the better regulation of stream flow and provision of dilution waters. The practice is to reckon the benefit as equal to the "alternate cost" of providing sewage treatment; but this is inconsistent with the view that sewage treatment itself confers economic benefits in excess of its costs. Either the multiple-purpose project should be credited with the (hypothetical) benefit of the alternate provision that would be necessary, or sewage treatment should be counted as collective expenditure instead of investment. In the writer's view, the latter course is simpler and in principle preferable.

FURTHER OUTLOOK

In general, water-pollution projects do not, therefore, lend themselves to benefit-cost analysis. This conclusion may be found difficult to reconcile with current notions and forecasts of increasing water demands and shortages, which, if true, might be expected to entail more care in the use of water. These forecasts, however, themselves appear exaggerated: most industrial uses of water are not consumptive, and even when consumptive irrigation demands are taken into account there still remains a wide margin in the United States between over-all consumption and average run-off. Moreover, forecasts commonly ignore the question of price. It is arguable that the price of water in the United States is too low to promote economy in its use. Water-supply undertakings commonly operate most efficiently at maximum capacity and their rate policies consequently

tend to encourage consumption. Moreover, their construction costs have often been incurred at a time when prices were much lower than they are today. In consequence, water is habitually, it seems, sold below replacement cost. (On the other hand, new water-development schemes are apt to ignore the influence of price upon consumption and provide expensive water that cannot be sold: the Metropolitan Water District of Southern California is one instance and the projected California Water Plan looks like another.) This suggests that the incentive to schemes of sewage reclamation (for instance) has hitherto been insufficient, but that, on the other hand, rising prices may damp down demand for water, and hence for some forms of pollution abatement, in the future. More information on this whole question of water prices is urgently called for; but if the opinion that they are too low is justified, then more stringent pollution-control regulations are to be welcomed as, in effect, tantamount to a price increase.

The writer concludes that no form of economic analysis, even freed from current ambiguities and contradictions, will obviate the need for administrative judgment in considering individual water-pollution control schemes. The chidings of the more ardent advocates of benefit-cost analysis are unjustified; the golden rule is that there is no golden rule.

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